CHEMICAL MARKETS

THE BUSINESS MAGAZINE OF CHEMICAL INDUSTRIES

VOLUME XXXII JUNE, 1933 NUMBER 6

Contents for June, 1933

Regular Departments

CHEMICAL MARKETS *is indexed regularly in the* INDUSTRIAL ARTS INDEX

Publication Staff

Williams Haynes
Publisher and Editor

A. M. Corbet
Assistant to the Editor

Walter J. Murphy
News Editor

William F. George
Advertising Manager

Lynwood N. Harvey
Circulation Manager

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Published on the tenth day of each month at Pittsfield, Mass., and printed for the publishers by the Sun Printing Company.

Entered as second class matter, January 1, 1928 at the Post Office at Pittsfield, Mass., under the act of March 3, 1879.

SUBSCRIPTION RATES are: domestic, two dollars, in advance, Canadian and Foreign, three dollars a year; single copies of the current issue are twenty-five cents each, back issues fifty cents each. Notice of three weeks is necessary in order to change subscriber's address, and in notifying, kindly give both the old and the new addresses.

EDITORIAL AND ADVERTISING OFFICES, 25 SPRUCE ST., NEW YORK, N. Y.; PUBLICATION OFFICE, PITTSFIELD, MASS.

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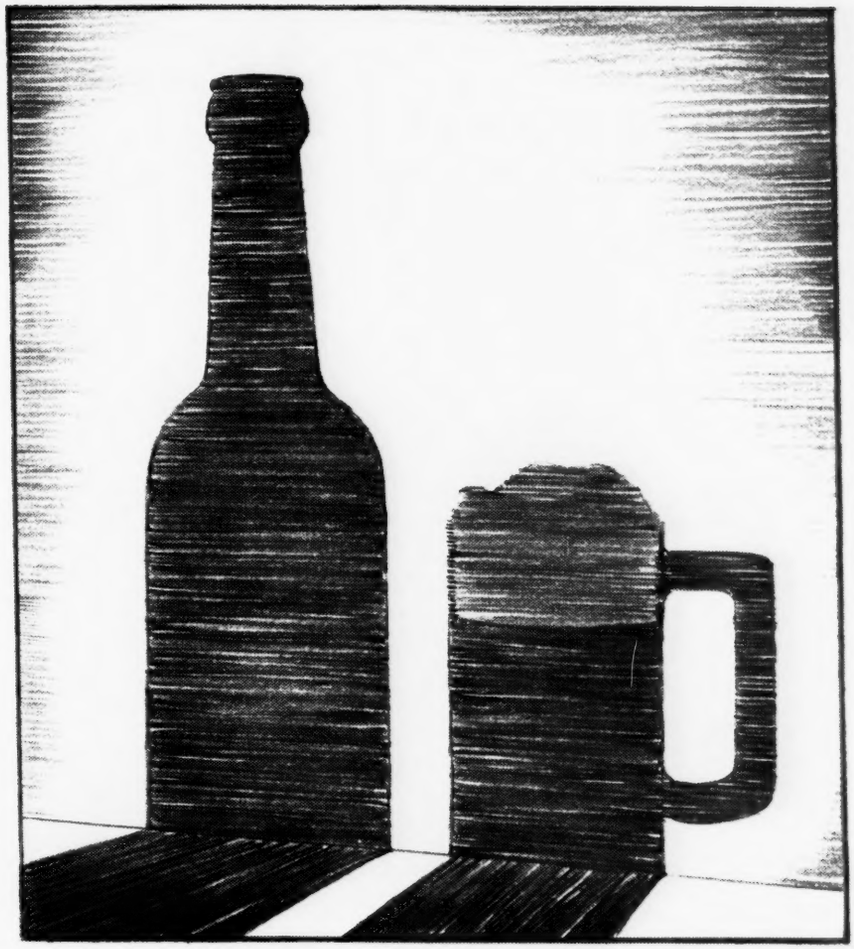

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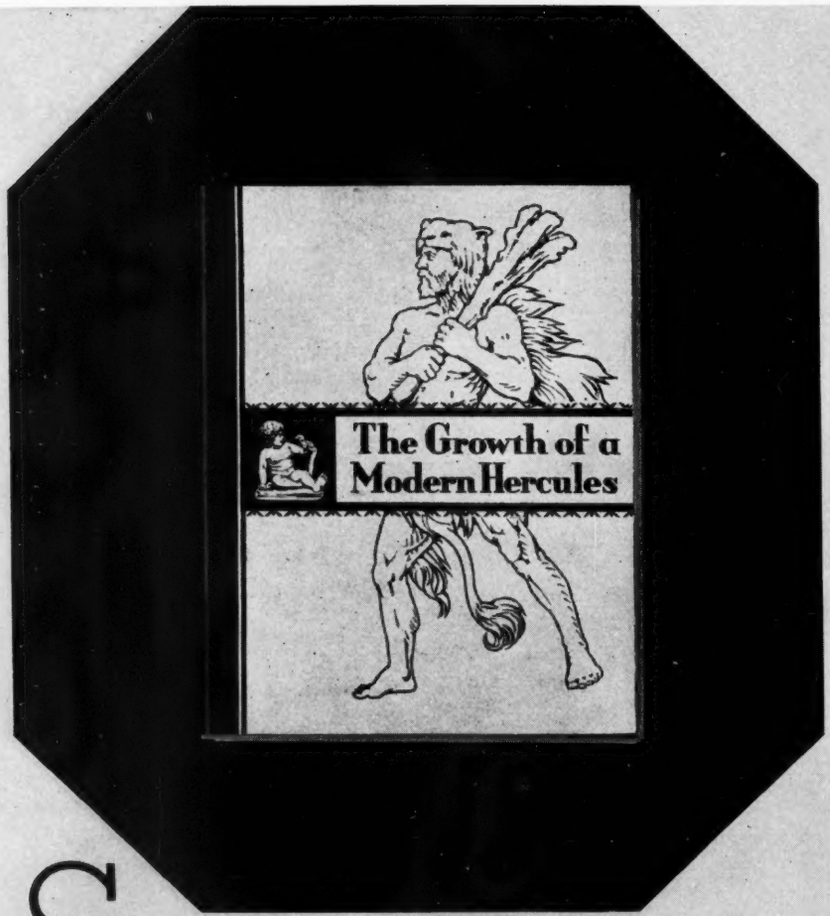

SUGGESTED READING IN CHEMICAL DEVELOPMENT

We have just published a book which tells how the Hercules Powder Company expanded in twenty years from a relatively small manufacturer of explosives to one of the world's larger chemical organizations whose products now serve major industries at home and abroad. Some of these Hercules products are listed below. Their manufacture and uses are described in *The Growth of a Modern Hercules.* We recommend this book to manufacturers, chemists, and engineers who are generally interested in the growth of the American chemical industry; or who have production problems that may fall within our field of manufacturing or research activity.

Some of the Industries Served by Hercules Products are:

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DOW Aniline Oil is guaranteed 99.5+% Pure. It is free from nitro and partially-reduced nitro derivatives, and copper. In addition to its extreme purity, it is water-white in color and will retain this light color for an extraordinarily long time when stored under proper conditions.

Aniline Oil is used extensively in the manufacture of aniline colors, aniline black, aniline salt, and azo dyestuffs. It likewise finds application in dyeing and calico printing. The rubber industry uses it in the production of accelerators and to some extent as an accelerator of vulcanization. It has a minor use in paint and varnish manufacture. Aniline Oil also enters into the manufacture of such pharmaceutical chemicals as acetanilid, salvarsan, etc., as well as in the synthesis of perfumes.

The extreme purity and water-white color of Dow Aniline Oil prove valuable in all of its many applications. Freedom from detrimental impurities and absence of discoloration are reflected in the cost and quality of resulting products.

PROPERTIES

Molecular Weight	93.06
Specific Gravity	1.0268 @ 15/15° C.
Weight Per Gallon	8.53 lbs.
Boiling Point	184.4° C. (363.9° F.)
Distillation	95+% distills within 1° C.
Freezing Point	−6.1° C. or −6.2° C. (21.0 to 20.8°F.)

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C.S.C.

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As a plasticizer for nitrocellulose lacquers and dopes, Butyl Acetyl Ricinoleate is superior to castor oil: its plasticizing power is greater—it yields films of greater gloss and pliability—it does not exude from the film.

Butyl Acetyl Ricinoleate emulsifies oil and water, producing oil-in-water emulsions of the quick-breaking type. These emulsions are stabilized by the addition of alkalies generally, and especially by ammonia.

Butyl Acetyl Ricinoleate has unique detergent properties which adapt it for use in soaps, cleaning compounds, and polishes.

The possibilities of Butyl Acetyl Ricinoleate as a lubricant have not been thoroughly investigated, but its characteristics are such as to indicate that it may impart useful properties to lubricating oils.

PROPERTIES

ODOR: Faint, fatty.
FLASH POINT: 230°F.
SAPONIFICATION NUMBER: 235.
ACIDITY (AS RICINOLEIC): Approximately 5%.
FREEZING POINT: Indefinite: becomes cloudy at −32°C and solidifies at −65°C.
BOILING POINT: 220° to 235°C at 3 to 5 mm pressure.
SOLUBILITY IN WATER: Practically insoluble.
SOLUBILITY OF WATER IN BUTYL ACETYL RICINOLEATE: Approximately 2%.
WEIGHT PER U. S. GALLON: 7.8 lbs. at 68°F.

Butyl Acetyl Ricinoleate is miscible with most common organic liquids.

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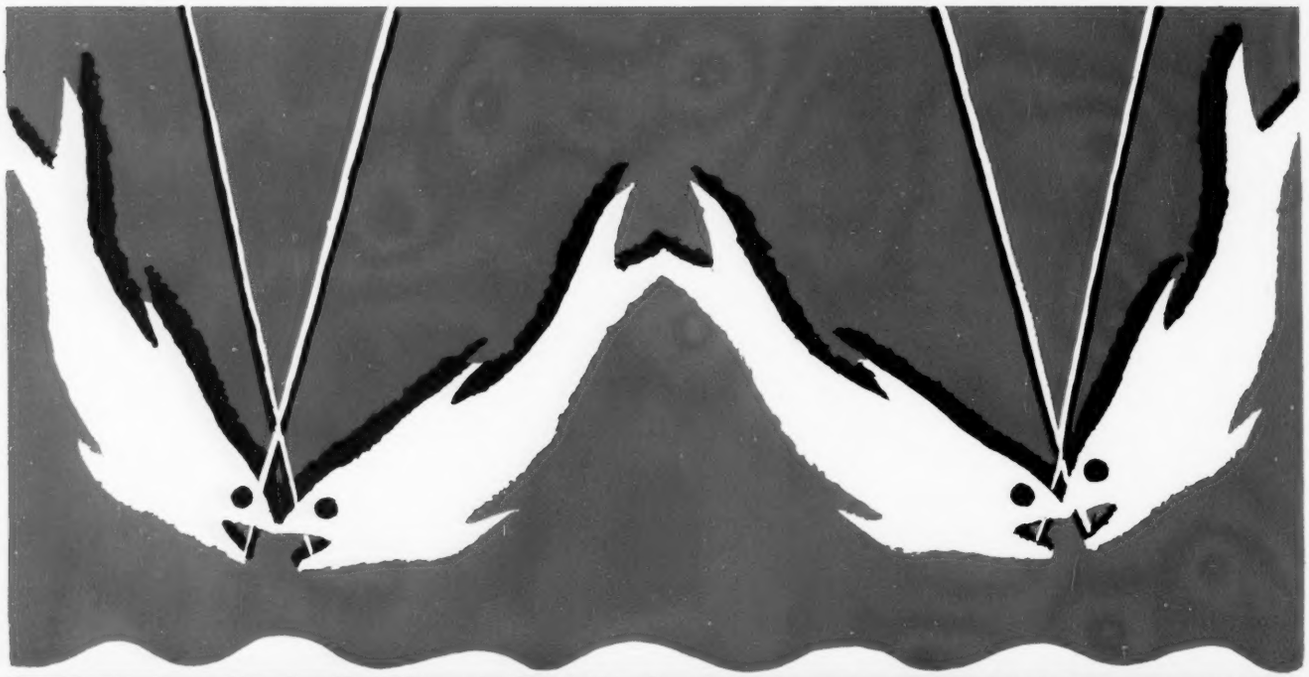
BUTYL STEARATE • BUTYL ACETATE
DIACETONE • BUTYL ACETYL RICINOLEATE
BUTALYDE • DIBUTYL PHTHALATE
ETHYL ALCOHOL • ETHYL ACETATE
METHANOL • METHYLAMINES



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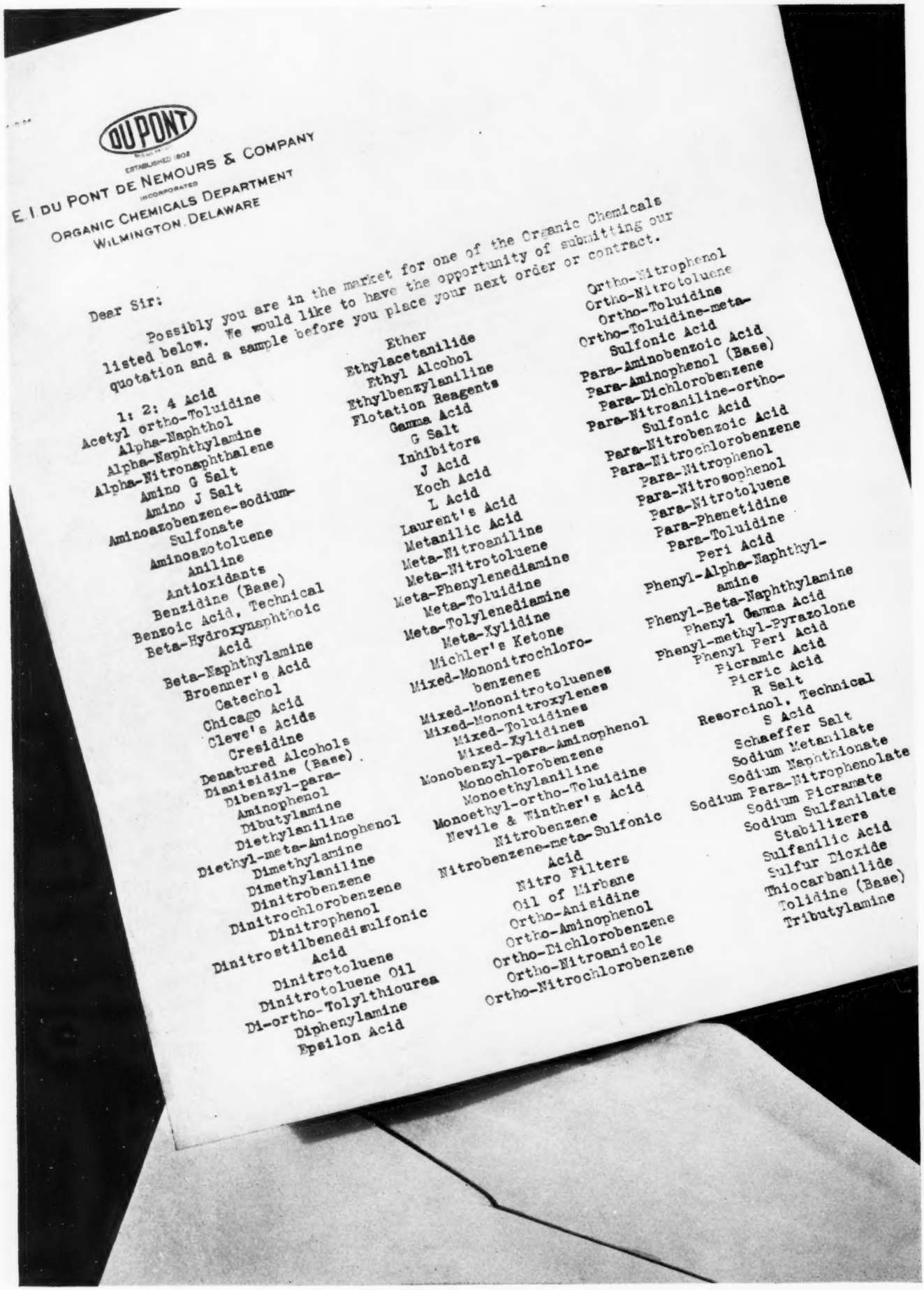

DU PONT

ESTABLISHED 1802

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INCORPORATED
ORGANIC CHEMICALS DEPARTMENT
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Dear Sir:

Possibly you are in the market for one of the Organic Chemicals listed below. We would like to have the opportunity of submitting our quotation and a sample before you place your next order or contract.

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Acetyl ortho-Toluidine
Alpha-Naphthol
Alpha-Naphthylamine
Alpha-Nitronaphthalene
Amino G Salt
Amino J Salt
Aminoazobenzene-sodium-Sulfonate
Aminoazotoluene
Aniline
Antioxidants
Benzidine (Base)
Benzoic Acid, Technical
Beta-Hydroxynaphthoic Acid
Beta-Naphthylamine
Broenner's Acid
Catechol
Chicago Acid
Cleve's Acids
Cresidine
Denatured Alcohols
Dianisidine (Base)
Dibenzyl-para-Aminophenol
Dibutylamine
Diethylaniline
Diethyl-meta-Aminophenol
Dimethylamine
Dimethylaniline
Dinitrobenzene
Dinitrochlorobenzene
Dinitrophenol
Dinitrostilbenedisulfonic Acid
Dinitrotoluene
Dinitrotoluene Oil
Di-ortho-Tolylthiourea
Diphenylamine
Epsilon Acid
Ether
Ethylacetanilide
Ethyl Alcohol
Ethylbenzylaniline
Flotation Reagents
Gamma Acid
G Salt
Inhibitors
J Acid
Koch Acid
L Acid
Laurent's Acid
Metanilic Acid
Meta-Nitroaniline
Meta-Nitrotoluene
Meta-Phenylenediamine
Meta-Toluidine
Meta-Tolylenediamine
Meta-Xylidine
Michler's Ketone
Mixed-Mononitrochloro-benzenes
Mixed-Mononitrotoluenes
Mixed-Mononitroxylenes
Mixed-Toluidines
Mixed-Xylidines
Monobenzyl-para-Aminophenol
Monochlorobenzene
Monoethylaniline
Monoethyl-ortho-Toluidine
Nevile & Winther's Acid
Nitrobenzene
Nitrobenzene-meta-Sulfonic Acid
Nitro Filters
Oil of Mirbane
Ortho-Anisidine
Ortho-Aminophenol
Ortho-Dichlorobenzene
Ortho-Nitroanisole
Ortho-Nitrochlorobenzene
Ortho-Nitrophenol
Ortho-Nitrotoluene
Ortho-Toluidine
Ortho-Toluidine-meta-Sulfonic Acid
Para-Aminobenzoic Acid
Para-Aminophenol (Base)
Para-Dichlorobenzene
Para-Nitroaniline-ortho-Sulfonic Acid
Para-Nitrobenzoic Acid
Para-Nitrochlorobenzene
Para-Nitrophenol
Para-Nitrosophenol
Para-Nitrotoluene
Para-Phenetidine
Para-Toluidine
Peri Acid
Phenyl-Alpha-Naphthyl-amine
Phenyl-Beta-Naphthylamine
Phenyl Gamma Acid
Phenyl-methyl-Pyrazolone
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Picramic Acid
Picric Acid
R Salt
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Sodium Naphthionate
Sodium Para-Nitrophenolate
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as to why this industrial cleaner is more efficient and economical

Grasselli SODIUM METASILICATE

GRASSELLI

Grasselli Sodium Metasilicate has—

- **Water Softening Properties**
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- **Wetting Power**
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- **Buffer Action**
- **Bactericidal Action**
- **Soap Enhancing Power**

The specific advantages of these properties are clearly explained in this folder. . . . Send for it.

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Metal Industry	*Dairies*	*Garages*
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Mallinckrodt Phenobarbital and Phenobarbital Sodium are made by new processes developed in our own laboratories.

The sparkling appearance of our Phenobarbital U.S.P., the clear solubility without residue, the high melting point,—all indicate greater purity than required by the U.S.P.

And in Phenobarbital Sodium N.N.R., the same clear solubility without residue, in alcohol or water, indicating the absence of harmful impurities . . .

Are proofs of the superiority of these products; that recommend them to pharmaceutical and hospital users.

A sample will be sent for examination.

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CHEMICAL MARKETS

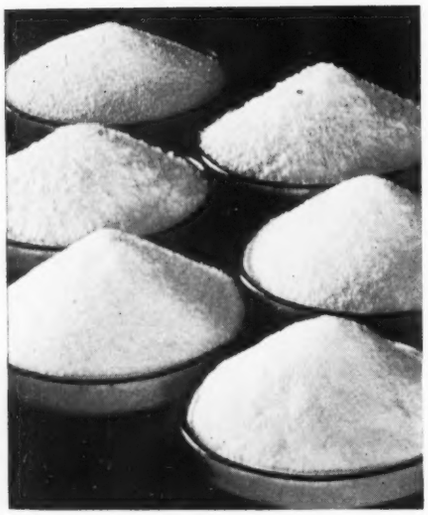
VOLUME XXXII NUMBER 6

Control vs. Co-operation

TIME for consideration of the Industries' Control Bill is given by the action of the Senate Finance Committee. For this we should be devoutly thankful since no such radical piece of legislation has been introduced into Congress in the past twenty years and its effects cannot but profoundly change the American business tradition of equal economic opportunity for all. Embarking upon so bold an experiment without more consideration of the industrial point of view is foolhardy when even the most theoretical reformer admits that it is our industries alone which have the resources and the courage necessary to restore prosperity.

As passed by the House the Bill had several outstanding bad features. The proposed licensing would make it impossible to start a new business or add a new product without permission, and put into the hands of a single man the power of life and death over any business enterprise in the country. It would force the unionization of all labor and enforce national hour-and-wage scales. If it accomplished its avowed purpose of raising prices and pay, it would render many American manufacturers vulnerable to dangerous attack from imported goods.

A chance is given now to review these and other provisions of this revolutionary law; but there is no doubt in Washington that it will pass eventually and in a form that will force much closer co-operation between Government and Industry. In that event, the chemical industries are fortunate in having ready to hand a common organization. The Chemical Alliance, Inc., was originally organized at the insistence of Mr. Baruch to deal with the War Industries Board. Its charter has never been surrendered, and its organization in committees could quite simply be changed to represent the existing associations representing heavy chemicals, coal-tar synthetics, alkalies, alcohol, pharmaceuticals, fertilizers, and insecticides.



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ACID and PHOSPHATES

from the clean white heat and accurate control of

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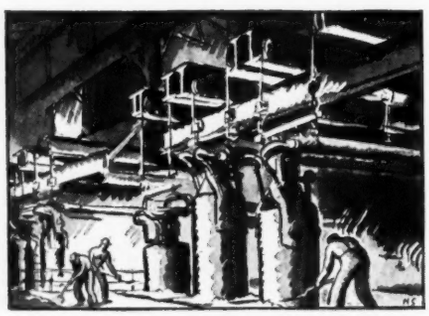

Accurate control, constant laboratory watchfulness, assure phosphates that fit your needs precisely

The perfection of the electric furnace method of producing food grade Phosphoric Acid by Swann Research enabled whole fields of industry to improve their products.

Swann Research, constantly studying the needs of industry, searches for a better way of producing essential materials more closely adapted to the products of industry.

The widespread acceptance of Swann Phosphoric Acid and Swann Phosphates comes from their essential purity which Swann's production methods make possible.

Today Manufacturers must look toward product improvement to increase desirability of their goods. Our research, development and manufacturing facilities are at your service. Call or write our nearest office.

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Phosphoric Acid 75%
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Di Sodium Phosphate
Tri Sodium Phosphate
Sodium Acid Pyrophosphate
Mono Ammonium Phosphate
Di Ammonium Phosphate
Mono Calcium Phosphate (H T Phosphate)
Di Calcium Phosphate
Tri Calcium Phosphate

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Crooks, Cranks and Grafters Jimmie Walker's chemical friend over in Brooklyn proposed to make other things than subway station tiling and the persuasive expert in fruit juice sterilization sold more stock certificates than apparatus. A chemist in Germany has been offering a decoloring process for butter for which one at least American creamery paid thirty-five dollars to learn that the secret was activated carbon! Another genius has been recently trying to sell the chlorine makers an electrolytic process for the home purification of water. The number of crooks, cranks, and petty grafters that are trying to put across some clever sort of chemical deal has been multiplied excessively during the past couple of years. Some are harmless fools; others are shrewd racketeers. At best they waste the time of executives and research directors: at worst they mulct the gullible public out of many good dollars. Crazy or crooked they hurt legitimate chemical interests.

It would be well if some organization would undertake to serve as a public clearing house for information on these illegitimate schemes and schemers. The American Chemical Society, the Institute of Chemists, or the Chemical Engineers, or the Association of Consultants might any of them properly undertake this work.

We are collecting a file on these foolish-wicked chemical adventurers with the object of giving them some undesirable publicity, and our subscribers some entertaining and instructive reading. We will welcome therefore any cases you can report—facts are essential, but we shall be glad to treat them in strictest confidence.

Sic Semper Tyrannis Among the inner circle of the President's advisers a certain peevishness is being displayed toward business which is not only unbecoming, but which reveals a mental attitude that is more than disconcerting. It seems that our industrial leaders have not been quick enough to take advantage of the great opportunity to restore prosperity that Mr. Roosevelt's stupendous effort has created. The slightest hesitancy to fall in with the President's proposals is taken as evidence of a cowardly and disloyal spirit of obstructionism. We cannot agree with this diagnosis and we protest that its implications are unjust.

If business has hesitated it is due chiefly to certain inherent inconsistencies in the acts of the leader in Washington. No Rooseveltian program has been announced—indeed, the President admits he is out "to try anything once" and to abandon it promptly if it fails to bring the desired results. This is surely a philosophy of action; but it is not the best method of winning the confidence of men who have habitually trained themselves to question the effects that flow from executive decisions. All things considered, the support Mr. Roosevelt has enjoyed is nothing less than miraculous. He has been faithfully followed down several new paths that lead dangerously to positions far from traditional Americanism. There has been surprisingly little criticism and virtually no concerted opposition. This astonishing success ought not to delude his devoted retainers into the belief that the king can do no wrong. Nothing would so quickly raise antagonism as a return of the old Wilsonian tyranny that branded as treachery any honest question and outlawed as a menace to society any opponent.

Domestic Prices Advance Quite logically the first price advances as we abandoned the gold standard, were largely imported materials. Immediate decline of the value of the dollar as expressed in foreign currencies and the uncertainty surrounding its future course forced importers to raise dollar quotations in this country. In the past month not only has this trend continued but several important chemicals generally considered as being domestic items joined the upswing.

The advance in acetate of lime one-quarter of a cent was immediately followed by a one-eighth cent advance in acetic acid quotations. Of greater surprise was the increase of 20 cents per hundred pounds in disodium phosphate—a weak spot in the price situation for many months. In line with the generally firmer levels in most of the potash salts, potassium chlorate was offered at a one-quarter cent advance; cyanide, five cents, and red prussiate, two and one-half cents, the last having been exceptionally weak for several months. Domestic tartaric acid producers announced a one-half cent increase, and all of the stearates strengthened as stearic acid went one-half cent higher.

We know of no company that has made a practice of incorporating in its contract form any provision for increasing the price upon our abandonment of the gold standard. A number of companies, however, have had a "gold clause" reading that payment is to be in the equivalent of U. S. gold dollars, and others

have been adopting these terms, although there is good legal opinion that such a restriction would be unenforceable or might furnish a valid reason for cancellation in event of serious inflation.

Quite likely chemical price advances will not be as numerous or as marked as in other industries. The *Journal of Commerce's* weekly index of prices shows a chemical advance of 1.3 points in the period between March 4 and May 13. This is very modest when comparison is made with grain, 22.1 points; textiles, 12 points; foods, 7.9; paint materials, 8.8. Spot prices of many chemicals will be advanced before fall, if the present improvement in business persists and further inflationary policies are adopted. In most instances such advances will be but the forerunner of higher contract prices for 1934.

The New Competition Whatever has become of our boasted American shrewdness? Here we are solemnly embarking in a business we know little about; which is admittedly highly hazardous; and for a stake that represents normally about a nickel in a dollar's worth of our trade.

That is what this juggling of the dollar and haggling with the tariff means. For five per cent. of our national business we are gambling with the security of our currency and the only means at our command to maintain the American standard of living.

As a sensible straight-forward business proposition, this is lunacy compared with the revaluation of the dollar at say 75 per cent. of its old gold value (in order to raise prices) and the imposition of a flexible super tariff based on the amount of the currency depreciation of the country exporting (in order to protect our own dollar and our domestic products). Then we might go to work cutting down our production capacities of everything from locomotives and wheat to pins and peanuts and intensively cultivating the largest and the richest in the world.

A New Crop of Issues It has been commonly noted for several years that the line of demarcation between our major political parties is very faint, and this lack of sharp division on questions of national policy has contributed to our political woes. For without clean-cut issues the interest of the voters lags and their elected representatives escape responsibility. The bloc system and the power of organized minorities are symptoms of this vital failure in the two-party political scheme.

But a change is due, and Mr. Roosevelt's Administration promises to be of a character that will grow a much needed crop of new issues. It is too early to forecast the harvest; but some of the seedling issues are already sprouting.

Two old questions are already raised: the historic struggle for power between the executive and the legislative branches of the government and the old battle between gold and/or paper-silver currency. The fundamental switch from an agricultural to an industrial nation is already past-due as a new basis for much of our domestic policy and more of our foreign policy, and so as a foundation for a sounder, more modern political alignment. These changes will be interesting to watch, and at the outset it is significant that the President by word and deed repudiates every tenet of his party (with the questionable exception of the tariff) as laid down by Thomas Jefferson.

Quotation Marks

Control of the inflation program is the most necessary factor, from the standpoint of safeguarding the future of the country. If this is supplied, inflation may move forward rather steadily, instead of violently, thus giving buyers and sellers an opportunity to adjust themselves gradually to the new conditions. That would be the most desirable situation.—*Class & Industrial Marketing.*

Forty-four per cent. of British factory production is from firms employing less than 200 persons.—*Austin Hopkinson.*

Against the awful and fearful picture of 10,483 bank failures in the United States during the last twelve years, involving a total deposit of just a shade under five billion dollars, England and Canada show not a single bank failure since 1915.—*The Paper Industry.*

Fifteen Years Ago

From our issues of June, 1918

Baugh Chemical Co. wins verdict for $139,433, awarded against Davison Chemical Co. for failure to deliver sulfuric acid under contract.

International Nickel Co. reports net profits of $10,129,988 for the year ended March 31.

H. Koppers Co. awarded contract by Jones and Laughlin Steel Co. for the construction of a by-product coke plant of 300 ovens, with a carbonizing capacity of approximately 2,000,000 tons per year.

National Aniline announce first shipment of alizarine red, this industry formerly being under German control.

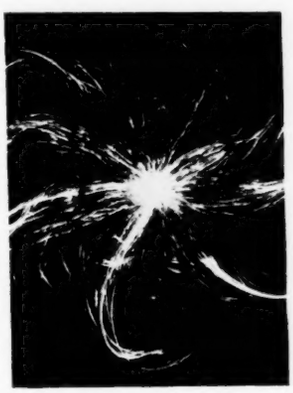
Chemist discovers new process for making glycerin by fermentation of blackstrap molasses.

Du Ponts establish 18 Fellowships and 33 Scholarships at leading colleges to aid students in chemistry.

Cellulose Specifications

Preparation and Uses of Commercial Grades of Chemical Cotton

Cellulose fibre dispersing in 72% H_2SO_4



Silkweed seed and fibre

Silkweed cellulose fibre

By Lloyd Kitchel

KNOWLEDGE about cellulose is accumulating rapidly and much has been learned recently about how to treat it so that its better qualities can be used to advantage. Some of its well-hidden secrets have been disclosed and new uses for it are being found continually.

Cellulose appears in all vegetable fibres: in cotton, trees, grass, sugar cane, leaves. It is found in its highest purity in cotton fibre so cotton has played a leading role in the new cellulose-compound industry. During the early stage of discovery and through the period of experiments, long staple cotton was the source from which the research chemist, and later the manufacturer of new compounds, obtained cellulose.

As processes were developed for making explosives, lacquers, rayon, celluloid, and other products from cellulose, it became necessary to find cheaper cotton cellulose which would retain all the quality advantages of long staple cotton. Cotton linters thus came into prominence. They are the short fibres left on the seed after the long fibres have been removed by ginning. Short, dark colored, they resemble true cotton only slightly, yet they are as pure cellulose as their longer-fibred brothers.

Before the cotton seed can be crushed for the removal of oil, the short fibres (linters) still clinging to them must be removed. Their presence would cause absorption of the oil during pressing and thus lower the oil yield. To effect this removal, the seeds are passed first through a cleaning apparatus which removes the "field trash" such as sand, leaves and pieces of the cotton boll. Travelling in conveyors, the seed then goes to the linter machine which is somewhat like a gin. It enters the top of the machine and passes through a row of disc saws, set closely together, revolving at high speed. Usually a "first cut" of fibres is taken off and the seed is passed on to another machine where a "second cut" is made. But in some mills all the fibres to be removed are taken off in one cut, known as "mill run."

The quantity of linters "cut" per ton of seed is regulated by various adjustments to the machine. In the

Advance abstract of "Hercules Chemical Cotton". Photos courtesy Hercules Research Laboratory.

Cellulose fibre from wood chips

Cellulose fibre from cotton linters

Cellulose fibre, high magnification

"first cut" stage, the seed passes through the machine rapidly and only the longer fibres are removed. In producing "second cuts," the seed remains in the machine longer and more of the fibres are taken off. As might be expected, these fibres are shorter than those removed in other "cuts". The linters emerge from the machine onto a condensing roll and are ready for baling, while the seed coming out of the bottom of the machine passes through conveyors to subsequent milling operations.

"First cuts," because the fibres are longer, can be garnetted or carded and consequently used in upholstery and mattresses. They are also utilized in spinning, replacing the lower grades of cotton. For these reasons, they demand a higher price than that of other "cuts."

"Second cuts," cheaper than "first cuts" or "mill runs," but as high in cellulose content, offer an attractive saving to the cellulose-compound industry. From a quality standpoint, "second cuts" have an advantage in that most of the field trash comes out with the longer fibres of the other "cut."

Proper Type Cotton Linters

The selection of the proper type of cotton linters for the manufacture of any given quality of finished chemical cotton is of extreme importance. Second cut linters are used chiefly; however, careful inspection is necessary. The difference in quality of lots of second cut linters produced at different oil mills is often considerable. This lack of uniformity of quality results from a number of different causes. First, the condition of the seed received by the oil mill, for seed containing a high percentage of field trash will produce a dirty linter, even though some of the contaminating material is removed by mechanical devices. Second, the condition and type of machinery in use at the oil mill will have a pronounced effect on quality. A mill equipped with modern seed cleaning apparatus and finely adjusted and correctly operated linter machines will produce a decidedly better quality linter than a mill not so equipped. All these points have to be watched and taken into consideration in the physical examination of linters.

Trained men visit all parts of the south, familiarizing themselves with conditions under which the cotton is grown in each section, visiting oil mills and observing operating conditions. With knowledge of the special problems of manufacturing chemical cotton, they select linters most suited for any particular requirement. But even such an exhaustive study of the linters does not prove conclusively that they are satisfactory. Often there exists an inferiority not visible to the eye. For instance, linters are sometimes produced from improperly stored seed. This condition cannot always be observed but the cellulose may have been damaged by it. To bring to light any such hidden defect, samples of all lots are submitted to the plant laboratory as a matter of routine practice.

At the laboratory, the linters are purified, bleached, and the finished chemical cotton analyzed. In addition to regular cellulose analyses, special tests are made which indicate its fitness for use in any particular industry. For example, if a particular lot is to be used for making chemical cotton for the cellulose acetate industry, acetylations are carried out and solutions made which are carefully examined. In other cases the chemical cotton is nitrated and solutions of nitrocellulose made and observed. Cuprammonium and viscose solutions are made when linters are being selected which will eventually go to industries using these two processes. All these various types of solutions are examined for color, clarity, solubility, and a microscopic study is included.

Description of Operation

Cotton linters are purified, bleached, and made ready for subsequent drying if the product is to be shipped in loose form, or to sheeting if the product is to be put up in the form of pulp sheets. Each purification unit consists of a digester (kier), wash tub, two bleach tubs, storage tanks and blending equipment. Serving these units also are all the necessary tanks for the cooking and various bleaching solutions.

To begin with, the exact quantity of linters to be used in a batch for one unit is weighed. The bales are opened and the linters fed to a machine which pulls them apart and separates out foreign material. At the end of this machine further separation of heavy foreign particles occurs when the linters are picked up by air and blown to the top of the purification building. Here the air used to convey the cotton is separated from it, taking with it light dust and fine particles of objectionable nature, while the cotton drops into a conveyor running above the series of digesters. Into this conveyor is also introduced the cooking solution which has previously been weighed, analyzed, and heated to the boiling point. Thus, at the time of entering the digester, the cotton is well picked apart and thoroughly wetted by means of intimate mixing with the hot solution.

In the digester the air is first displaced and then the "cooking" period commences. The cotton is "cooked," pressure and time depending on the quality of finished product desired. "Cooking" conditions as well as strength of the solution are carefully controlled so that, besides producing a clean product, the viscosity of the cotton when dissolved in a standard cuprammonium solution may come within the desired range. At the end of the cooking the mass is dropped into a wash tank and washed with pure water until free from all chemicals.

Purified and free from all oil and waxes, the cotton is dropped by gravity to the bleach tub. Further washing takes place here, and then the stock is bleached and receives other washing and finishing treatments. Temperatures and the time of each treatment are carefully controlled. All chemical solu-

tions are tested before using and every precaution is taken to see that no attack is made on the cellulose which would cause unnecessary deterioration. Excellent agitation or mixing is provided for in this operation so that uniform treatment is assured. After this operation the cotton flows into a storage tank. A complete analysis is made at this point and if found satisfactory in every respect, the cotton passes on to the cotton drying department or, if it is being made for use in viscose rayon, it goes to the cotton sheeting department.

Cotton Drying Department

The cotton is pumped over a series of riffles such as precede a fine paper machine and passes through a squeeze roll which wrings out excess water to about fifty per cent. moisture content. From here it enters a picker which pulls the cotton apart thoroughly so that lumps are eliminated, thereby permitting uniform drying. The segregated cotton now falls on a travelling apron which carries it through the dryer, a long, enclosed tunnel equipped with steam coils and fans which pass hot air through the cotton and evaporate the moisture. At the end of the dryer, conveyors pick the stock up and carry it to the balers where it is compressed and wrapped for shipment.

Cotton Sheeting Department

For viscose rayon, chemical cotton is produced in sheet form. On completion of purification and bleaching, the cotton is pumped to the sheeting department. Here, with other similarly accepted "cooks," it enters an elaborate continuous blending system which mixes them thoroughly in a series of large tanks, from the last one of which enough cotton is withdrawn at regular intervals to fill the beaters. Each tank in the series from the last to the first is replaced from the preceding tank by this small amount. Obviously, the finished product from such a systematic operation is extremely uniform.

The cotton finally enters a beater which is especially equipped so that the stock is brushed out. From the beater, the cotton passes through a refining engine which makes it suitable for the paper machine. This modern paper machine is equipped with a Fourdrinier wire, on which the sheet is formed and then passed over the dryer rolls. The temperature of the rolls is kept low, so that the cellulose will not be harmed. The mechanism for the accurate control of moisture content in the finished sheet is an important feature of this machine. Sheets are cut according to the size required by each customer, though the thickness of the sheet has become standardized at about .04 inch.

Quality

Each industry using chemical cotton has problems of its own which make certain special specifications necessary. Therefore, no one type can be produced suitable for all users. Because of this condition, special qualifications are established based on extensive study to produce the most suitable type of cotton for any given operation. Once each type is developed, strict control of process steps makes possible the absolute standard of quality and uniformity desired.

Regardless of purpose, certain fundamental points of quality are essential. The cotton must be clean and of good white color, for these are important factors in the clarity and color of almost all chemical solutions made from cotton. This color and this cleanliness must be obtained without deterioration of the cellulose itself, for such degradation would affect not only color of solutions but strength and permanence of finished products, such as film, threads, etc.

One exact specification (common to nearly all users of chemical cotton) is the viscosity of the cotton when dissolved in a standard cuprammonium solution. This variation in viscosity differentiates the grades produced; the desired range is established in each instance and kept within the narrowest possible limits. As a result of this careful control, all shipments of any one grade are uniformly the same in viscosity range as well as in other respects.

It is difficult to set down a list of specifications because of the many different grades produced and the special requirements of different industries. Experience in producing different types for diversified consumers makes it possible, however, to set up specifications which will meet particular problems. Nevertheless, to give a general idea of what such guaranteed specifications will contain, there is shown below a typical analysis of a low viscosity type used generally in the manufacture of celluloid.

Alpha cellulose	98.50%
Viscosity (Hercules method)	15 seconds
Soda soluble	3.50%
Copper number (Marquerol)	.25
Ash	.08%
Sulphuric acid insol.	.15%
Ether extract	.10%
Color	1.0

Typical Viscosity Ranges

Regardless of special specifications, the viscosity range for one type will be the same as for another type, if the same viscosity is required. The following standard viscosity ranges have been established.

Type	*Viscosity*
5. second	3 to 9 seconds in ½ concentration
10 "	10 to 25 " " " "
30 "	26 to 49 " " " "
50 "	50 to 100 " " " "
150 "	101 to 200 " " " "
250 "	201 to 400 " " " "
500 "	401 to 600 " " " "
800 "	601 to 1,000 " " " "
D (unbleached)	150 + seconds in ⅕ concentration.

Viscosity in a standard cuprammonium solution is one of the items to be considered in deciding the proper grade of chemical cotton to use in the manufacture of any product of the cellulose compound indus-

try. This is especially important in the manufacture of nitrocellulose products where a definite relationship can be established between the viscosity of the chemical cotton and the viscosity of the resulting nitrocellulose. If nitrating conditions, such as acid mixture, time, and temperature are constant, a decrease in the initial viscosity of the chemical cotton will result in a proportionate decrease in nitrocellulose viscosity.

Viscosity reduction must take place in one of three places: in the preparation of the chemical cotton; during nitration; or during the purification and stabilization of the nitrocellulose. In any case reduction of viscosity is accomplished by using higher temperature, longer treatments, or stronger chemical solutions. When such procedure is followed in the nitrating process (especially if it is carried to an extreme), lower yields of nitrocellulose will result. But if nitrating temperatures are too low and other conditions too mild, non-uniform nitration will result. Therefore, a medium course must be followed. The manufacturer of nitrocellulose products has a wide range of viscosities to choose from, commencing as low as three seconds and running up to 1,000 seconds or higher in the case of unbleached chemical cotton for dynamite manufacture. A suitable range of viscosities can be established which will suit most perfectly individual requirements.

Celluloid

In the celluloid industry, the use of a chemical cotton with a viscosity of between 10 and 20 seconds has become practically universal standard practice, though in the past year a number of consumers have changed to a higher range around 30 seconds. Either type is especially suitable and will produce a clear sheet of celluloid such as is required in making non-shatterable glass. Cotton absolutely free from haze-producing impurities is essential in this work and also in the production of the delicate pastel shades where depth and brilliance of color can only be imparted when the celluloid is clear and free from color. These viscosity ranges allow high enough temperatures in nitrating to obtain complete nitration and still retain the strength and plasticity of high grade celluloid. At the same time satisfactory yields can be procured so that even deeply colored and pigmented stock (where clarity is not as important) can be made in the most economical manner.

The physical as well as the chemical condition of chemical cotton plays a most important part in getting these optimum results; that is, highest possible quality of finished product plus good manufacturing yields. Special importance is attached to color which must be very white and clean, an indication of extremely pure cellulose. This property influences directly the color and clarity of the celluloid and it is obtained without damage to the alpha cellulose or without any increase in the hemi-cellulose content.

Film

The viscosity range used in making film has not been nearly so standardized as in celluloid. Some manufacturers use a high viscosity cotton and reduce it by means of nitrating at fairly high temperatures and sufficient boiling and stabilizing treatment. By far the largest number, however, use a medium or fairly low viscosity and find the resulting product sufficiently plastic and tough to meet the most exacting projection tests. Film strength is closely related to nitrocellulose viscosity. A high nitrocellulose viscosity is desirable because of strength, while a low nitrocellulose viscosity permits economies in the amount of solvents used. Thus a compromise is necessary.

When a high viscosity chemical cotton is used and consequently drastic nitrating conditions are employed to reduce the viscosity to the desired point, the nature of the process will iron out any non-uniformities in the chemical cotton. Where a lower viscosity chemical cotton is employed, however, and the nitrating conditions are less severe, the cotton must be extremely uniform, because under such mild treatment any slight non-uniformity will become more pronounced.

Lacquers

Since the viscosity of all nitrocotton used in the manufacture of lacquers is reduced in operations subsequent to nitration, the initial viscosity depends entirely on the manufacturers' methods. Knowing these conditions, a cotton can be supplied which will give the greatest efficiency, the highest yields, and the most satisfactory product. Uniformity of the chemical cotton, once the proper type has been decided on, is of course essential to smooth, efficient operation. Although most lacquers are heavily pigmented and therefore the color of the chemical cotton would seem to be of no great importance, it should be absolutely uniform so that colors can always be matched.

Dope for Artificial Leather

In the manufacture of dope for artificial leather, no standard range of viscosity has been adopted, because conditions in different plants vary widely. The type and strength of solvents used, the method of applying the dope to the fabric, and the quality of finished product desired—all influence the choice. One factor, however, is important to any operation and that is uniformity.

Cellulose Acetate Products

In discussing nitrocellulose, it was pointed out that a definite relationship exists between the viscosity of the chemical cotton and the viscosity of the resulting nitrocellulose. Cellulose acetate viscosities are not nearly so closely dependent on the original viscosity of the cotton. For this reason the viscosity range of

any given grade does not serve so nearly as a means of operating control as in making nitrocellulose. A wide series of different viscosity ranges are being supplied depending, of course, on conditions at various plants. Low and medium viscosity cottons are, perhaps, better suited to the production of cellulose acetate because of the greater cleanliness and higher degree of purity which are obtained in these ranges.

However, the physical condition of the cotton is most important. Particular care, for instance, is taken not only in controlling the final moisture content but also in the method by which the cotton is dried. Automatic controls for maintaining even and uniform low temperature drying are installed on all dryers.

Cuprammonium Silk

For manufacturers of cuprammonium silk, uniformity and exact viscosity of chemical cotton are of particular importance. This is obvious, since the cotton is to be dissolved in the same type of solution as is used in determining its viscosity. Freedom from all foreign impurities is especially important because the filtration of cuprammonium solutions is more difficult than in the case of other cellulose solutions. Cotton cloth or cotton batting, which are ideal as filtering media in other processes, are useless here because of the action of the cuprammonium solution on such materials. Cleanliness and uniform viscosity are two points which are stressed in producing chemical cotton for this industry. The physical, as well as the chemical, condition of the fibres must be such that the whole mass is easily dispersed.

Viscose Rayon and Transparent Cellulose

For the manufacturers of viscose rayon or transparent cellulose made by the viscose process, most producers are equipped to handle only sheeted pulp. As far as chemical specifications are concerned, only one type is regularly furnished—a type which has become standard throughout the industry. A typical analysis of this is as follows:

Alpha cellulose	98.75%	minimum
Viscosity (cuprammonium)	13	seconds
Soda soluble	2.75%	maximum
Ash	.08%	"
Ether extract	.09%	"
Sulfuric acid insoluble	.10%	"
Iron (Fe)	.0018%	"
Copper No. (Marquero)	25	"
Thickness of sheet	.040	inches

In the viscose process, sheeted chemical cotton is generally used in conjunction with sulfite wood pulp. By far the most producers are using from 40% to 50% cotton and 50% to 60% wood pulp, though in some places higher percentages of cotton are employed. The size of the sheets is cut to the customer's specification, but it should be borne in mind that cotton sheets shrink more in the caustic steeping operation than do wood pulp sheets. This difference, therefore, must be compensated by using cotton sheets of a larger size than wood pulp so that, at the end of the steeping operation and before pressing, both cotton and wood will have shrunk to the same size. The correct size of cotton sheet to use depends upon the type of wood pulp with which it is to be mixed. Generally speaking, however, a sheet 8% longer and 7% wider will be satisfactory.

Formerly wood pulp alone was used in making rayon, but in the past few years (when quality of yarn has become more and more important) cotton pulp has been included. Now sheeted chemical cotton is being used in more than eighty per cent. of all viscose rayon produced in the United States. From a quality viewpoint, cotton unquestionably aids in producing a better yarn because an increase in elongation and strength and an improvement in the color of the yarn are definitely obtained. It is natural to expect that such improvements should be attained when it is considered that cotton cellulose (to begin with) is a much purer cellulose than that of wood.

Because of this original high degree of purity, cotton cellulose can be prepared for the viscose industry by mild treatments which leave it unharmed—practically with its original strength and structure. Wood, on the other hand, must undergo drastic treatment to make it suitable for use. Even then it contains a high percentage of hemi-cellulose which finds its way into the finished yarn. High alpha cellulose content in sheeted chemical cotton permits economies in the quantity of caustic soda consumed because there is less contamination of the caustic with hemicellulose.

Paper Making

Both loose and sheeted chemical cotton are used in the manufacture of paper. They both are clean and very white and thus lend themselves admirably to high-grade paper making. When used in place of rags, this cotton pulp eliminates all the expense of rag sorting. Its freedom from metal or rubber does away with one source of trouble which is ever present when rags are employed. Like "half stuff," it is ready for the beaters with no preliminary work to be done on it. It is best suited for use in non-strength papers such as blotting, book and papeteries.

Algerian Phosphate Production

For January, 1933, phosphate production in Algeria totalled 43,300 metric tons as compared with 53,800 tons December, 1932. January exports exceeded production by 26,000 tons. It is reported in Algeria that Cie. des Phosphates de Constantine and Cie. des Phosphate et du Chemin de Fer de Gafsa are to combine in the near future. If so, it would bring together the two leading commercial producers in North Africa. Constantine produced practically all of the 571,000 tons of phosphate mined in Algeria during 1932, although some shipments were made by others from stocks. Gafsa, leading producer in Tunisia, accounted for almost 70 per cent. of the 1,623,000 tons exported from that country during 1932.

Disabling Injuries, 1932, Chemical Industry, by Industrial Groups.

INDUSTRIAL GROUP	No. of Industrial Units	Man-Hours Worked (Thousands)	Average Number of Employees	NO. DISABLING INJURIES				NUMBER OF DAYS LOST				INJURY RATES	
				Death & Perm. Total	Perm. Partial	Temporary	TOTAL	Death & Perm. Total	Perm. Partial	Temporary	TOTAL	Frequency	Severity
ALL GROUPS	266	174,908	74,460	41	114	1,687	1,842	246,000	61,357	28,624	335,981	10.53	1.92
Carbon Products	10	5,225	2,604	0	2	12	14	0	2,250	162	2,412	2.68	.46
Industrial Gases	12	2,045	854	1	0	7	8	6,000	0	259	6,259	3.91	3.06
Acid Manufacturing	15	16,995	5,043	3	15	66	84	18,000	3,854	1,310	23,164	4.94	1.36
Dye Manufacturing	7	9,877	4,263	6	7	64	77	36,000	3,045	1,334	40,379	7.80	4.09
Paint and Varnish Manufacturing	27	22,142	10,167	1	4	186	191	6,000	1,650	3,553	11,203	8.63	.51
Explosives Manufacturing	25	13,307	6,353	13	2	125	140	78,000	360	2,060	80,420	10.52	6.04
Chlorine and Alkali Manufacturing	8	5,256	2,201	2	3	52	57	12,000	1,460	1,550	15,010	10.84	2.86
Pharmaceutical and Fine Chemical Manufacturing	19	10,207	4,530	4	6	148	158	24,000	2,444	1,183	27,627	15.48	2.71
Soap Manufacturing	19	23,072	9,845	4	28	346	378	24,000	13,570	5,028	42,598	16.38	1.85
Vegetable Oil Manufacturing	24	4,636	1,644	0	7	98	105	0	10,688	1,437	12,125	22.65	2.61
Coal Tar Distillers	14	1,197	452	0	0	29	29	0	0	307	307	24.23	.26
Salt Manufacturing	11	3,928	1,541	0	4	128	132	0	3,100	1,952	5,052	33.60	1.29
Fertilizer Manufacturing	8	1,187	467	0	0	46	46	0	0	1,420	1,420	38.75	1.20
Not Otherwise Classified	67	55,834	24,396	7	36	381	424	42,000	18,936	7,069	68,005	7.59	1.22

Lower Accident Tolls

in the

Chemical Industry

1932 Report of the National Safety Council

CHEMICAL plants made a further reduction during 1932 in the frequency of disabling injuries, but had the worst experience of recent years in severity. The 1932 frequency rate is 14 per cent. below 1931, but the 1932 severity rate is 16 per cent. above 1931. A pronounced increase in the number of fatalities accounts for the unfavorable 1932 severity rate. Table II shows that the fatality index of the chemical industry has risen in each of the last four years and is now higher than in 1926. Permanent partial disabilities and temporary injuries, on the contrary, dropped both in frequency and severity.

The 1932 experience of chemical plants is similar to the records in several other industries whose figures have been compiled at this date. Severity rates increased from 1931 to 1932 in electric railway organizations, automobile plants, and paper and pulp mills, whereas frequency rates in these important industries declined. The records of the construction, rubber, clay products, and printing and publishing industries, however, show improvement in both injury rates.

All reporting chemical plants averaged 10.53 in frequency and 1.92 in severity for 1932. These rates are based on the records of 266 establishments, whose employees worked almost 175,000,000 man-hours during the year. While the number of reported units is the largest in the history of the chemical industry, the exposure is somewhat below 1931. The change in the accident experience of the industry from 1931 to 1932 is more reliable than in earlier years because it is based on the records of more companies than reported for any previous two-year period.

Considering the records in various branches of the industry, manufacturers of carbon products had the lowest frequency rate, 2.68; and coal tar distillation plants had the lowest severity rate, 0.26. The average frequency rate was highest among manufacturers of fertilizers, 38.75; and the highest average severity, 6.04, occurred among explosives manufacturers. Table on this page shows considerable room for improvement in frequency among coal tar distillers, manufacturers of salt, and plants producing vegetable oils.

Severity rates were particularly high in dye plants, chlorine and alkali manufacturing establishments and among makers of industrial gases, pharmaceuticals and fine chemicals, and vegetable oils. These high severity rates raise the average severity rate for the industry considerably above the rates for rubber, meat packing, glass and automobile plants. The frequency rate for all chemical plants, however, compares favorably with rates in these industries.

Large plants had the best 1932 frequency records but small ones excelled in severity, as shown in the following tabulation:

	Frequency	*Severity*
Large Units	11.36	2.19
Small Units	16.66	1.30

The difference in rates of large and small plants is especially marked in some branches of the industry; small acid plants, for example, averaged 12.77 in

Index Numbers of Accidental Injury Rates, by Severity of Injury, Chemical Industry*

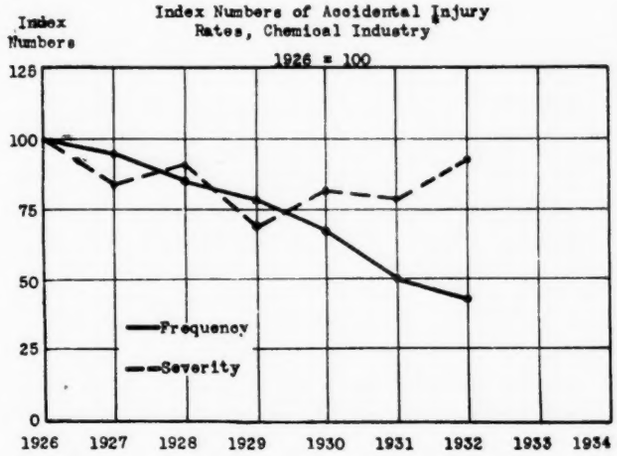
1926 = 100

Year	FREQUENCY RATE INDEX				SEVERITY RATE INDEX			
	Death & Perm. Total	Perm. Partial	Temporary	TOTAL	Death & Perm. Total	Perm. Partial	Temporary	TOTAL
1926	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1927	83.9	68.9	93.6	92.0	83.9	83.3	95.4	84.9
1928	102.5	68.9	86.6	85.6	102.5	65.0	88.6	90.7
1929	68.3	77.5	78.6	78.1	68.3	63.3	82.3	69.5
1930	72.6	100.0	67.2	68.3	72.6	122.9	66.5	82.7
1931	90.8	73.3	49.3	50.5	90.8	80.2	53.8	79.6
1932	126.0	67.0	41.9	43.5	126.0	57.8	47.8	92.3

Table II

frequency and 2.84 in severity, against 4.94 and 1.13 in large plants. Reporting companies should compare their 1932 rates with the averages for their size group, and in addition, with the averages for their entire classification.

The wide differences in individual injury rates in the various groups show the opportunities for better safety records. Frequency rates in soap works, for example, vary from 3.90 to over 28.00, and severity rates from 0.003 to 4.70. It would seem that a reasonable standard of attainment for those with the high rates is 16.38 for frequency and 1.85 for severity—the average rates for all plants in this group.



The three-year record of each reporter is shown in the detailed tables whenever it is available. If a company's rates show a tendency to increase, or indicate no progress during this period, a new investigation of plant hazards should certainly be made. Likewise, if an organization has made substantial reductions in frequency but severity continued high, a logical conclusion is that minor hazards have been eliminated but some serious ones remain to be determined and corrected. Special attention to the accident situation in each plant is important at this time because, in the event of a pick-up in business, it will very likely become more difficult to maintain a good record or to improve a poor one.

Companies reporting industrial injury rates for this pamphlet do not supply information on the causes of the accidents producing the injuries. In the absence of such data the following table is given, covering compensated injuries in chemical manufacturing of New York State for the year ended June 30, 1930. The table was prepared by the New York State Department of Labor.

Reported Causes	*Total Number of Cases*	*Death and Permanent Total*	*Permanent Partial*	*Temporary*
All causes	1,457	30	312	1,115
Handling objects	471	1	77	393
Using hand tools	59	0	19	40
Falls of workers to a different level	134	6	28	100
Falls of workers on the same level	140	1	23	116
Machinery, prime movers, etc.	145	4	65	76
Elevators, hoists, and conveyors	48	2	19	27
Vehicles	48	2	14	32
Falling objects	55	3	10	42
Electricity, explosives, heat, etc.	105	9	11	85
Harmful substances	162	2	23	137
Stepping on and striking objects	37	0	6	31
Other or indefinite	53	0	17	36

HONOR ROLL FOR 1932

Acid Manufacturing

Pennsylvania Salt Mfg. Co. Greenwich plant, Philadelphia, Pennsylvania, made the largest improvement in frequency from 1930 to 1932 among small plants—79 per cent.; also in severity—60 per cent.

Manufacture of Carbon Products

Union Carbide Co. The Fremont, Ohio plant of the National Carbon Company, a subsidiary, worked more hours without a disabling injury than any other large unit in this group—439,000. Also, it has reduced both injury rates 100 per cent. since 1930. The *Cleveland, Ohio* plant, also of the National Carbon Company, had the largest exposure without a disabling injury among small plants—260,000 man-hours.

Chlorine and Alkali Manufacturing

Niagara Alkali Co., Niagara Falls, N. Y. Best 1932 record—443,000 man-hours without a disabling injury—100 per cent. reduction since 1930.

Coal Tar Distillers

American Tar Products Co. Carrollville, Wisconsin plant has the best 1932 record among large plants—42,000 man-hours without a disabling injury. St. Louis, Missouri plant leads small units by working 25,000 man-hours without a disabling injury. Also 100 per cent. reduction since 1930.

Dye Manufacturing

General Aniline Works, Inc., Rensselaer, New York. Best 1932 record in severity—0.29

Explosives Manufacturing

Hercules Powder Co., Wilmington, Delaware. The Blasting Cap Division is the only organization among large units to reduce frequency and severity consistently from 1930 and to attain a perfect record in 1932. The Experimental and Research Department leads small units by working more hours without a disabling injury than any other unit in the group—263,000 man-hours. 100 per cent. reduction since 1930.

Fertilizer Manufacturing

Canadian Industries Ltd. The New Westminster plant has the best 1932 record by working 63,000 man-hours without a disabling injury. Only plant in the group to reduce frequency and severity consistently from 1930 and to attain a perfect record in 1932.

Manufacture of Industrial Gases

Union Carbide Co. The Diamond, West Virginia plant leads the large establishments by working the most hours without a disabling injury—94,000 man-hours.

Carbo Oxygen Co. The Cleveland, Ohio plant worked 33,000 man-hours without a disabling injury—a higher exposure than any other plant with a perfect record.

Paint and Varnish Manufacturing

Canadian Industries Ltd. The Toronto, Ontario plant leads large establishments by working 385,000 man-hours without a disabling injury. Consistent reduction from 1930 in rates.

Manufacture of Pharmaceuticals and Fine Chemicals

Upjohn Co., Kalamazoo, Michigan. Best 1932 record in frequency among large establishments—5.34; also in severity—0.03. Largest consistent improvement in frequency from 1930—52 per cent.; also in severity—98 per cent.

Hynson, Westcott & Dunning, Baltimore, Maryland. Worked 187,000 man-hours without a disabling injury—highest exposure of any small plant with a perfect record.

Baker Extract Co., Springfield, Massachusetts. The only small plant to reduce both injury rates consistently since 1930, and to attain a perfect record in 1932.

Salt Manufacturing

Morton Salt Co., Port Huron, Michigan plant leads large establishments in frequency with a rate of 19.53. The Chicago, Illinois plant leads small plants in frequency with a rate of 6.08 and in severity with a rate of 0.05. Newark, California has made the largest consistent improvement in frequency since 1930 among small plants—80 per cent.; also in severity—84 per cent.

Diamond Crystal Salt Co., St. Clair, Michigan. Best 1932 record in severity among large establishments—0.33.

Soap Manufacturing

Lever Brothers Co. Cambridge, Massachusetts plant has the lowest 1932 frequency rate among large plants—3.90.

Perkins Soap Co., Springfield, Massachusetts. Best 1932 record among small plants—21,000 man-hours without a disabling injury.

Manufacture of Vegetable Oils

Spencer Kellogg & Sons, Inc. Minneapolis mill has the lowest 1932 severity rate among large plants—0.07.

Not Otherwise Classified

Virginia Carolina Chem. Corp., Richmond, Virginia. Largest consistent improvement in severity since 1930 among large plants—60 per cent.

Hercules Powder Co. The Celluloid Products Division leads middle-sized units by working most man-hours without a disabling injury—537,000. Also largest to make consistent improvement in both injury rates since 1930 and to attain perfect 1932 record.

U. S. Industrial Alcohol Co. The Westwego, Louisiana plant is the only small unit of the group to reduce both rates consistently since 1930, and to attain perfect record for 1932.

German Tar-Distillation Figures for 1931

Official figures published by the Government Statistical Office on the German coal tar distillation industry for 1931 are quoted in "Die Chemische Industrie." Owing to the closing down of several small plants, the number of tar distillation works in operation in 1931 declined to 108, the number of people employed being 3,382, after the 3,960 of 1930. Total production of coal tar distillation products during the year was 1.2 million tons, or 500,000 tons less than the peak production of 1928.

The quantity of tar worked up was four-fifths coke-oven tar and one-fifth gasworks tar, the actual figures being 908,600 tons of the former and 232,400 tons of the latter. Products made were as follows, the figures being in thousands of tons, and those in parenthesis relating to 1930: Coal tar pitch, 521.9 (683.0); prepared and distilled tar, 185.5 (239.3); heavy tar oils, 350.0 (415.7); naphthalene, 41.8 (46.8); anthracene, 4.0 (12.5); pyridine bases, 0.6 (0.7); phenol and cresol, 16.3 (15.8); benzol, 23.0 (22.4); toluol, 2.1 (2.9); xylol, 8.4 (9.8); cumarone resins, 1.9 (3.1); and other products, 20.6 (27.7).

The German briquette industry accounted in 1931 for about two-thirds of the domestic pitch production; considerable quantities of pitch are, however, now being coked for the production of electrode coke, this pitch coke displacing imported petroleum coke. Prepared tar is used in the roofing felt industry, in steelworks, briquettes, and as a road material. The last-mentioned use has been increasing considerably: in 1924 it was only about 3,000 tons, but by 1930 had increased to about 150,000 tons, although 1931 saw a decline to 110,000 tons. About 33 per cent. of the German output of pitch and prepared tar was exported in 1931, the principal markets being France, Holland, and Belgium. Imports during the year, which were 40,000 tons, came principally from Czecho-Slovakia, and were unusually high.

The make of heavy coal-tar oils in 1931 included 165,000 tons of impregnating oil, 73,000 tons of burning oils, 44,000 tons of benzol wash oils, 29,000 tons of anthracene oil, and 39,000 tons of other heavy oils. About one-third of the total output was exported, more than half of these exports going to the U. S. A. The benzol produced at tar distilleries in 1931, amounting to 33,000 tons, was produced principally from the crude benzol of the coke-ovens and gasworks. About 14,000 tons was sold as motor benzol.

The naphthalene output in 1931 included 22,000 tons of crude naphthalene, and 10,000 tons each of pressed and purified naphthalene. About half the output was exported, principally to the U. S. A. Production of anthracene in 1931 showed a further considerable decline. Owing to the development of the phthalic anhydride process, pure anthracene is now in reduced demand for making mordant and vat colors. It is stated that outside Germany pure anthracene is no longer being made anywhere, and that German exports of the product which mainly go to the United Kingdom and Switzerland are usually comparatively high. In 1931 these exports were only 400 tons, but in 1932 they increased to 1,200 tons. The figures showing output of phenols and cresols were made up of 4,700 tons of carbolic acid crystals, 7,000 tons of crude carbolic acid, 3,300 tons of cresol, and 1,300 tons of other products such as ortho-cresol, meta-cresol, etc. Exports in 1931 were 4,100 tons.—*Chemical Trade Journal.*

Abrasive Materials Industry, 1932

The year 1932, according to the U. S. Bureau of Mines, was one of decreased output in miscellaneous natural abrasives. Most of the producers reported decreased sales, although a few reported increases in output as compared with 1931, and a few reported slightly higher selling prices over the preceding year.

The following table shows the quantity and value of natural abrasives sold or used by producers in the United States in 1932, with 1931 for comparison:

Commodity	*1931* *Short tons*	*Value*	*1932* *Short tons*	*Value*
Emery	512	$5,557	250	$2,781
Garnet	2,946	193,015	1,950	147,350
Grinding pebbles, and tube-mill lining	2,024	26,211	976	13,070
Grindstones	6,994	221,272	6,001	158,656
Millstones, chasers, and dragstones	.....	5,330	.....	4,450
Oilstones, whetstones, hones, scythe-stones, and rubbing stones	370	81,951	331	63,960
Pulpstones	1,730	120,877	1,667	88,874
Pumice	68,819	338,586	53,214	235,204
Tripoli	26,682	310,131	14,775	232,700

In addition, there were manufactured and sold during the year 38,910 short tons of artificial abrasives, valued at $2,876,748, compared with 44,368 short tons, valued at $3,918,109 in 1931. These were divided as follows: Carbides, 11,593 short tons, valued at $1,066,064 (8,193 tons, $967,840 in 1931);aluminum oxides, 18,835 short tons, valued at $1,400,420 (25,070 tons, $2,336,586 in 1931); and metallic abrasives, 8,482 short tons, valued at $410,264 (11,105 tons, $613,683 in 1931). It will be noted that there was an increase of 3,400 short tons of silicon carbide in 1932 over 1931.

Agency and Consignment Plans of Maintaining Chemical Prices

A continuation of the memorandum on the problem of controlling the resale price of chemicals which was published in our last issue.

BOTH of the above plans in a variety of combinations are now extensively used in numerous industries, as a means of controlling trade practices and maintaining resale prices. A more or less pure form of the agency plan has been used for years in the automobile industry. It can be said that this system is almost the universal practice of that industry.

The agency plan is usually based on a contract made between the producer and an agent (distributor) to whom the manufacturer may or may not consign goods. Usually a consignment arrangement of some character is involved. Ordinarily the distributor sets the resale price. He may or may not, according to the specific arrangement, be responsible for the credit risk. If goods are consigned, payments are made by the agent (distributor) as the merchandise is disposed of. Exclusive territory rights are frequently involved.

It is certainly most interesting to observe that in a reply to a questionnaire of the Federal Trade Commission, the automobile manufacturers were unanimously in favor of legislation which would permit the manufacturer to set the price which would be charged to the ultimate consumer. In other words, the industry which apparently is using a limited agency system to a greater extent than practically any other industry, is unanimously in favor of legalizing a different plan which specifically gives to the manufacturer the right to control resale prices.

This action seems to prove that the agency plan being used by many of the automobile manufacturers has disadvantages, or at least that it does not solve all the problems in the resale price maintenance field of this particular industry.

The agency and consignment plan is undoubtedly being employed to an increasing extent in industry today. This can be ascribed to many reasons, some of which are:

1. It increases the quantity distribution of merchandise.
2. It enables the manufacturer to control the resale price, preventing in this way a chaotic market.
3. It assures a profit.
4. It enables a manufacturer to carefully pick his distributors—those possessing satisfactory credit rating, adequate sales forces, desirable storage facilities, etc., etc.

The problem of maintaining the resale price is a comparatively simple one if the title to merchandise of any character remains in the hands of the manufacturer thereof. In other words, the actual owner can dictate the price at which his merchandise may be sold by his agents (dealers) who are paid for their services, which may vary greatly in both extent and quality, dependent on the specific arrangement, or a commission basis.

It must be recorded that some industries that have used the agency and consignment system over a long period of time abandoned it for many different reasons. Undoubtedly, the irresponsibility of some distributor was one of the main causes.

The contract underlying an agency and consignment agreement may vary widely in its provisions: the amount of commission paid is dependent upon the services rendered by the agent. He must be paid for storing the merchandise. He must be compensated for assuming the credit risk which he usually does under this plan. Some portion of the expenses of his sales forces must be born by the principal. If any physical change is made in the packaging of the merchandise, the dealer must be paid therefore, etc., etc.

The agency and consignment system is certainly not ideal. It has many disadvantages. Some of these follow:

It undoubtedly increases the responsibility of the manufacturer in every direction.

It necessitates larger capital investment—larger inventories must be carried by the manufacturer.

It increases the manufacturer's sales costs.

It requires the keeping of extensive additional records and necessitates careful and frequent actual checking of the agents' statements and stocks.

It really forces the manufacturer to enter the distributing business.

It reduces the number of outlets for the product of the manufacturer because dealers (agents) frequently insist upon obtaining exclusive territory rights.

It tends to limit the initiative of the distributor which may result in a decreased volume of sales.

It enables the agent to manipulate the stocks consigned to him. Sales may be pre-dated when an increased price goes into effect, and conversely, consigned stocks may increase if prices fall.

The operation of the agency and consignment plan, and particularly the contract between the principal and agent involves very intricate questions of law. Because of the extreme importance of these legal questions both national and state laws must be carefully considered and agreements should not be arrived at nor contracts drawn except upon the advice of competent counsel.

In the absence of a law specifically permitting the maintenance of resale prices, and as experience has demonstrated that the agency and consignment plan goes a long way toward solving the resale price problems of many industries, this plan certainly appears to offer at least a partial solution for some of the problems of chemical manufacturers.

German Chemical Export Trade

In common with other trades, German chemical industry has not been spared the effects of the world depression, and the losses in trade it has suffered, both at home and abroad, are quite considerable. The export of chemical and pharmaceutical products constitutes one of the principal items in German foreign trade, and in 1931 it amounted to 974 million marks, or about one-tenth of the total German exports. The proportion was increased in 1932 to one-eighth, but the goods sold last year were worth only 692 million marks, which means a drop of about 30 per cent. Practically every item on the list has suffered a setback, in some cases as much as 50 per cent. Basic chemicals, acids, salts, and other compounds of basic chemicals fell from 426 million marks in 1931 to 306 millions last year. Paints and colors were exported for 193 million marks against 259 million in 1931. Potassium sulfate dropped from 51 million marks in 1931 to 27 millions. The exports of barium, lead, sodium, and nickel compounds fell from 42,000 tons to 38,000 tons, and in connection with this item it is interesting to note that the value of the goods exported remained the same, namely about 52 million marks for each year. Certain products, however, have not suffered such a heavy drop as it is supposed, for instance, the quantity of potassium sulfate exported in 1932 was about 223,000 tons against 355,000 in 1931, and the price realized was 24 million marks less which corresponds to a reduction in price of about 14 per cent. only. The same circumstances apply to soda, pure and bleaching, and other cleansing materials. The Germans even succeeded in increasing their export of these from 61,000 tons in 1931 to 95,000 tons last year, the value of the goods being about eight and ten million marks respectively, representing a drop in price of about 20 per cent. Another considerable increase in exports took place in potassium nitrate (Chile saltpetre), of which Germany exported a total value of 21 million marks against eight million marks in 1931.

Considered generally the chemical markets remain much the same, England heading the list with 28 million marks, Holland with 26 million, and Switzerland with 21 million (all these figures are for the first nine months of last year only, totals for the year not being available yet). The heaviest losses the Germans have suffered has been in their business with the United States which bought for 19 million marks only against 43 million for the same period in 1931. The position of trade experienced a slight improvement during the last few months of 1932 both inland and for export, but since then no appreciable change has taken place in the situation.

Lately Germany has introduced restrictions on the importation of lard and paper wood, which measure has affected some other countries, namely Czechoslovakia, Poland, United States, and Russia. Apart from that, several commercial treaties have lately expired, and some have been renounced. Among these are Sweden, Holland, Chile, and the Argentine. The effect of this will be an automatic increase of duties on the imports from those countries into Germany. It was not to be expected that all these countries would look with equanimity upon the damage to their trade as a result of this policy, and some of them have not been long in devising retaliatory measures. But official steps apart, the feeling in those countries against German imports seems to have grown very strong, and the German papers are full of reports giving details of the injury that is being done to the German export trade by the Government policy. The chemical industry, that counts among the countries concerned some of its best customers, views with great concern the further development of this mutually destructive trade war, realizing that this is giving the competitors a very good chance to get a foothold in the markets where German trade dominated before.

The greatest damage done to the exports of German chemicals are the foreign exchange restrictions. Here again, the German manufacturers have very good reason to put part of the blame at least on their own Government. Germany was the first to introduce the control of currency when the financial crisis broke out over the country in the middle of 1931. The panic was great, and it is quite possible that this measure did prevent the German mark from breaking away from its moorings. The German example was soon afterwards followed by nearly the whole of Europe and some countries outside, in several cases for no apparent reason at all, simply as a retaliatory step. Gradually the foreign exchange restrictions, from the original aim of saving the currencies from depreciation, have been turned into a weapon of throttling imports, the imports from Germany including. It is clear that as long as Germany persists in keeping these restrictions, other countries will do the same, causing great damage to the German export trade in general and to the export of chemical products in particular.—*The Chemical Age.*

World Consumption Non-Ferrous Metals

Nineteen hundred thirty-two witnessed a continuation of decrease in the consumption of non-ferrous metals throughout the world, and the consumption of many of them sank to low levels not reached in the preceding ten years. Nickel shared in this experience. The estimated world consumption of nickel in all forms in 1932 was 57,000,000 lb. as compared with 73,000,000 lb. in 1931, indicating a recession of about 22 per cent., a figure comparable with that for non-ferrous metals. Total nickel deliveries in the world market, excluding America, were only seven per cent. less in 1932 than in 1931, practically all of the decrease in total nickel consumption having occurred in the American market, where the decrease amounted to about 37 per cent. as compared with 1931.

World consumption of the metals of the platinum group fell off substantially in 1932, due principally to the unsatisfactory condition of the jewelry trade, as well as to the lack of activity in the electrical industries. Considerable technical progress has been made in the electroplating of these metals and it is now possible to plate palladium in substantial thicknesses—up to 0.020 inches. Types of platinum-gold and of the palladium-gold alloys of white color have been developed and described which appear to be well adapted for dental construction, and are being currently produced and offered by dental manufacturers.—*The Chemical Age.*

Is Uncle Sam *Your* Competitor?

By W. A. McDermid
Industrial Management Counsel

THAT the Federal Government is today in an incredible number of businesses is not news of a startling kind. It is to many an old and a sad story.

It may be seriously questioned whether any considerable number of business men realize to what extent this is true, and whether it has been impressed on those who do know just what is involved, not only for the present but as a growing threat to every citizen.

It would be impossible even to outline the many phases of this situation. All that can be attempted is to state in the most general terms a few of the highlights of the problems, some of the causes, and perhaps indicate the direction in which relief may be sought. In the January issue of "Chemical Markets" there was a startling statement, fully documented, of the manner in which the Bureau of Standards is in direct competition with consultants in chemical engineering, metallurgy, and other technical authorities. Nor is this competition confined to this particular professional group. It extends to doctors, surgeons, dentists, research organizations of all kinds, and consultants, not only in the field of technology, but in advertising and distribution, and in my own, that of industrial management and sales.

A Congressional committee (the Shannon) recently spent a number of months and $15,000 of taxpayers' money conducting hearings to investigate the question of Government competition with private business. A small part of the evidence achieved some publicity largely of an amusing or dramatic character and principally, relating to the retail stores (originally army canteens), at which not only Government employees but private citizens are enabled to buy a fantastic variety of goods at prices which no private merchant could possibly hope to meet.

The full significance of the Shannon report, however, was largely obscured by the character of this publicity, and failed to register on the consciousness of the public and the business man the fact that more than two hundred fifty different types of industry are being subjected to direct competition from the Government to the support of which these industries are in return heavily contributing. It is certain that this list is not inclusive, and that a more detailed analysis of the activities of various bureaus would have added to that list. A weakness of this, as of other reports of investigations, is its bulk. No one will read it. No one can. No adequate summary exists. If the revelations of these hearings were assembled in brief dramatic form, the business world would be shocked. As it is, hardly one business man in a thousand can remember having heard of it. Ask the next ten men you meet.

This report in itself would be a formidable indictment of the growing paternalism of the Federal Government, but does not represent the whole story. No one who has observed the steady growth of Government bureaus and commissions with their increases in appropriations and personnel can possibly be deceived into believing that this represents the end for there is daily evidence that the growth and extension of bureaucratic activities is still in progress. The chemical industry does not need an outsider to point to the implications of the Government's extension into certain fields of chemical production, and there are in many other industries, as well as in the professions, current evidences of intent on the part of the various bureaucracies involved to expand their their activities to the fullest possible extent.

"The Nation's Business" is performing a noteworthy service when it points out the heights of absurdity often reached by over-zealous Government workers. The question as to whether a flea or a frog can jump further according to their respective weights is, according to that publication, now a matter of definite scientific determination by employees of the Government. One of the most famous cases is an elaborate bulletin on how to design children's rompers —in spite of the fact that there are dozens of manufacturers and several great pattern companies amply able to supply that information. The list of absurdities is so great that there is danger that its ludicrous character will tend to obscure the appalling waste and duplication involved.

It is probable that there is not an industry nor a profession in competition with the Government not able to point specifically to activities either wholly unnecessary or produced in such form as to be more or less unusable, or constituting a duplication of work already done by private enterprise.

I can only join with Paul Mahler, who spoke for the chemical consultants, in referring briefly to a few examples taken from the bureau with which I am the most familiar—the Bureau of Foreign and Domestic Commerce in the Department of Commerce—that Department which has expanded in the past ten years so incredibly that to house it requires one of the largest monumental buildings in the entire country.

In criticizing some of the activities of this Bureau it is not intended to ignore the very many valuable services contributed by it to the welfare of American

business. In fact, any attempt to distinguish specifically between the useful and the useless strikes to the root of the whole difficulty, which is that it is largely a matter of personal judgment and selfish interest. It depends on whose ox is gored. And this difficulty to arrive at a standard of usefulness has enabled the bureaus to entrench themselves more deeply with every passing year. There is no question that any proponent of this Bureau can build a case for its activities, pointing to their value and benefit, which no fair minded critic can possibly deny. Yet, coupled with this there are activities which, so far as one man's practical experience goes, are utterly indefensible.

Use and Demand of Government Booklets

In my files are a number of Government documents. I pick up one at random—"Causes of Business Failures in New Jersey." There is no means of knowing, of course, how much it cost to produce, nor how long it took to prepare, nor how much contribution was made to the cost by co-operating organizations in that state. But I feel very certain that so far as the business public is concerned it contains nothing of sufficient importance in the matter of new or constructive information to justify its publication. For many years the causes of business failures, not only in New Jersey but all over the country, have been analyzed and reported regularly by the commercial reporting agencies, and even assuming that this Government analysis is more detailed or possibly more accurate than the percentage tables familiar to us all, the answer still remains—"What of it?"

This Bureau issues a set of seven brochures entitled "A Basis for Establishing Industrial Sales Territories." The preparation of a document with such a title competes directly with a very large number of individuals and firms serving as sales and marketing counselors. The very nature of it testifies to its high cost of production. When it first appeared I submitted it separately to three outstanding authorities in the use of statistical data as a basis for quota making. These three concurred in the opinion that at least four and probably five of the seven elements had no practical value as a basis, and also stated that the arrangement of the remaining material was in such form as to make it extremely difficult and costly to use in a practical manner. These criticisms were passed on to the Bureau and an index revising the arrangement was subsequently added. Material of this character might, by a neutral observer, be classed as not competitive to the activities of consultants or a proper field for private enterprise alone, but as a legitimate part of the basic data which the Government is best equipped to collect and promulgate. But if that point were to be granted, at least there can be no excuse for a recent project of the Bureau in this field.

Some two decades ago there was an outpouring of "how to do this" and "how to do that" type of books, most of them serving a useful and legitimate purpose. They were deservedly popular and achieved widespread sales and use. This general idea has now been adopted by the Bureau in the form of a booklet describing a specific program on how to analyze markets, set up and establish sales territories, and generally run a sales organization. There are many logical reasons for the Government's collection of statistical data, but it would be hard to convince my colleagues in this field of the justification of the booklet referred to. The same job has been better done, repeatedly, by "Sales Management" and "Printers' Ink," and it is still a question as to how much further into this field of activity the Bureau proposes to go.

Better perhaps than any personal opinion, is the application of the statistical method to determine the value of the outpouring of documents and services offered by the Government, and the first test of value might be an analysis as to how much actual demand for this material exists. Some publicity has already been given in the press to the tons of waste documents destroyed annually and to the lack of circulation or the limited circulation of many of these documents. This is a story all in itself deserving widespread dramatization, and affords a reasonably accurate gauge of value.

Distribution of Government Literature

The Government makes, and should make, legitimate efforts to secure widespread distribution for its documents. By so doing it brings to the American people a great deal of enormously valuable material. But if it is to be found that in spite of this legitimate promotional effort, a large amount of the material has no demand, there is an answer as to the value of the material which goes beyond any question of personal opinion. There are documents which I know of, published by the Bureau in question, that have been of such striking value that they have been reprinted repeatedly and are frequently out of print and not available. There are others which, beyond the circulation to public libraries and a very limited number of outside buyers, have never had any acceptance.

The second test which may be applied to these activities is whether the service could be better done by either trade associations, business papers, or private agencies, or all three. There is a fine line to be drawn between the statistics which the Government is best equipped to collect and services which it should properly render, and those which belong in the field of the industry concerned. The fact that an industry is willing or anxious to have the Government perform these services is irrelevant. In a large number of cases the work could be more efficiently done by one or more of the organizations referred to.

Again it is necessary to point out the favorable as well as the unfavorable side. Much of the statistical work of the Government is above criticism and of inestimable value; much of it is subject to criticisms, familiar to all. The time lag which makes many records too old to be of practical value is in many instances the strongest possible argument to industries in favor of making their own analyses. In other cases, since the Government must not violate confidence, the identity of companies and industries are submerged to such an extent as to make the figures actually misleading. In other instances the classifications of industries, trades and products are such that the figures are often meaningless.

Our "Blunderland" of Bureaucracy

It may be argued that these are errors in technique, and that the Government is prompt to modify its technique to meet the needs of industry. It is true that the officers of these bureaus are courtesy itself and betray a devoted willingness to be of any possible service and to engage in any form of activity for which there may appear to be a demand. But it is highly significant that in a very large number of cases they will *also* tell you that if they could "just get a sufficient appropriation" they would be able to do this or to do that thing in the manner suggested. It is not a question of technique at all—just the fundamental question as to whether the Government ought to do the job in the first place.

What has led to this "blunderland" of bureaucracy as it relates specifically to the relations of the Federal Government with our respective businesses? In the first place, a Government bureau tends to perpetuate itself and expand its activities, and commissions or bureaus started for a specific purpose either contrive to have that purpose extended indefinitely, or promptly seek other fields of activity. As an illustration take the activities of the recent census.

I confess to being one of a group of men who went to Washington some years ago and suggested to the Census Bureau the desirability of having its statistics collated by counties instead of states, the reason being that in most industries state lines are meaningless and the county is the statistical unit. We were informed that "if a larger appropriation could be secured" this would be done—and it ultimately was done. The recent census contained not only those classifications on which data has for long been collected, but it included radios as a special subject of inquiry.

When a bureau or division has finished its major job, or the job that brought it into being, it is only natural that it should look for other worlds to conquer. New activities suggest themselves. They are proposed to industries, and if there is even mild acceptance of the idea, it is taken to indicate a widespread public demand. Later on we will consider what happens.

More important than the perfectly understandable desire of bureaus to expand their activities, is the attitude of citizens and taxpayers toward the Government, without which these efforts toward expansion would be futile. We all commonly look upon the Government as some impersonal force whose resources come from other than ourselves, and we are glad to "let George do it." If it could be possible to substitute for the word "Government" the word "taxpayers" there would be a surprising change in the attitude of the American public in every walk of life.

When, as stated, the Government bureau comes to an industry with a suggestion of something that the bureau could do for the industry, no one stops to think it out—to weigh its value or its ultimate cost.

Value of Service

There is a question of fact involved here that would well repay investigation. Leaving aside for the moment the question of actual value of the service offered, the theory seems to be that the Government can do it more cheaply than the industry can do it for itself. I challenge that idea. In certain cases the initial cost may be less, which is to say that the Government can sometimes do a job for less money. But the secondary cost which arises out of the perpetuation of a bureaucracy, coupled with the quality of the job when it is done and its usability, are in my opinion factors which make the ultimate cost infinitely higher than if the industry did its own job.

Every attack on these services is apt to bring forth loud protests from what is termed "small business." The extent to which those protests are fostered by politicians is open to question and beside the point. The extent to which it is sincere is based on the belief that the "big fellow" has a tremendous edge on the smaller concern in the way of statistics, research, etc., and that it is part of the Government's duty to even up this inequality.

In serving more than thirty different industries, it has been my observation that the best, most accurate, and timeliest information available in or on any of these industries is to be secured from its trade press or its trade association, and that the amount of valuable information to be secured from Government sources beyond that which the Government has itself already secured from the industry, is relatively negligible. That we have definitely embarked on a program of state socialism cannot seriously be denied. By this, I do not refer primarily to the developments of the past few months. It has been stated, and I see no reason from my own limited observation to question it, that there has not been a major measure passed in Congress in fifteen years that has not been in the direction of increasing federalization of activities which used to be left to the individual or to local initiative.

With the number of people on Government payrolls almost doubled within the past few years, and approximately 25 per cent. of the national income devoted to taxes, it is only a question of time before a very large percentage of our population and income will be absorbed by governmental functions. Every thoughtful citizen should ask the National Board of Fire Underwriters for a copy of their leaflet "Taxes—You Pay Them All" which will be sent free on request.

What is the Solution?

Is there any solution for this growing menace? The principal solution, as it is to our governmental problems and others, is the increasing knowledge and activity of the individual citizen. For this as a complete answer I have no hope, because it seems to be virtually impossible either to educate or to arouse even the more intelligent and alert elements out of their apathy with respect to their Government, in spite of the fact that it touches their life at every point and threatens the welfare of their children.

Something can be accomplished by keeping the present wave of resentment against taxes alive. It is to be hoped that an increasing number of business men will consider that one of their important everyday jobs is to take the time to praise or condemn those officials who do or do not vote for simplification and economy in Government.

There may be more practical hope in a program to scrutinize more closely as individuals and as individual companies the various projects which now are passed without consideration. When your Chamber of Commerce or trade association offers a resolution requesting the Government to do thus and so, look it over. Nine times in ten it means more bureaucracy and more taxes. On the other hand, business requires and should have more and better information about itself. The lack of accurate information that exists in the average business organization is one of the unending marvels to anyone doing consulting work. How shall this be secured? The answer has already been indicated, namely, by the support, active and loyal, of the trade association and of the trade press. As to whether an industry or company should or needs employ any of the many admirable outside facilities for data and counsel, it might be unbecoming to suggest. But the fact remains that from the first two sources alone, more and better data can be secured at less ultimate cost than from governmental sources.

What has this to do with the threatened entry of the Government into more industries, among them the chemical industry? Merely this, that to the extent that industry becomes self-reliant, self-contained, and unwilling to pass the buck, willing to get results and pay for them, to that extent does it cut down machinery of Government and discourage those well-meaning and sincere people who press continually for an expansion of the Government into more and ever more fields of activity.

The Industry's Bookshelf

Textbook Of Salesmanship, by Frederic A. Russell, 428 p., published by McGraw-Hill Book Co., 330 W. 42nd st., N. Y. City. $3.00.

The book is designed primarily for use as a textbook for college and university classes in salesmanship, but it contains a wealth of material of practical value to the man already engaged in selling for a livelihood. The absence of flashy "high-pressure" tricks is commendable. The book is dignified, but thoroughly alive. In fact it is one of the best to enter the salesmanship "field" in a long while.

Conduction of Electricity Through Gases, Vol. 2, by Sir J. J. Thomson and G. P. Thomson, 608 p., published by The MacMillan Co., 60 5th ave., N. Y. City. $6.50.

The new volume completes the third edition and deals with ionization by collision and by X-rays and with the properties of the electric discharge in all its forms, glow spark and arc. The progress of the subject since the last edition has made it necessary to re-write almost the whole of this part of the book and to expand it to about twice its former size. Space does not permit a detailed review, but it is necessary to state that in its field the book is considered the most authoritative of its kind. That for those engaged in work of this nature, it is indispensable. In the 26 years since the second edition appeared thousands of papers dealing with the subject of discharge of electricity through gases have been published. This alone has necessitated almost complete revision, and less than 14 per cent. of the original matter remains in the new text.

Time, Space and Atoms, by Richard T. Cox, 154 p., published by Williams & Wilkins Co., Baltimore, Md., in conjunction with The Century of Progress Exposition. $1.00.

Another in the series of popular treatises on our sciences written by outstanding leaders in each division for the layman looking for facts without confusing details.

Science In The Changing World, by Julian Huxley and Others, 286 p., published by The Century Co., 353 4th ave., N. Y. City. $2.00.

A delightfully readable non-technical symposium written by several of our outstanding men of science surveying the nature and meaning of science and its relation both to the individual man and to civilization.

It is undeniable that science has brought material freedom, wealth and leisure, and liberation from famine and disease. But has science produced these things at the cost of spiritual slavery and personal servility? Does a machine-made civilization stifle artistic expression, or does it merely alter its sphere of activity? Is the progress of science inevitable, or does scientific progress contain within itself the seeds of decay? And in the changing world, is Man himself the subject of change or is human nature static? Has Man arrived at a stage when he can conduct a conscious experiment in making life worth living, and in taking evolution further along the line of biological and human progress? These are but a few of the questions which are examined. The answers are in many instances startling and revolutionary.

Experimental Chemistry for Colleges, by J. Allen Harris and William Ure, 192 p., published by McGraw-Hill Book Co., 330 W. 42nd st., N. Y. City. $1.25.

A practical manual for class and laboratory work for first year chemistry students that will instantly appeal to teachers because of its simplicity, arrangement and thoroughness. The pages are perforated so that they can easily be filed in a loose-leaf book which will appeal to the student.

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Ortho Nitro Toluene
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Para Amino Acetanilide
Para Nitroaniline
Para Nitrotoluene
Para Nitroso Dimethylaniline
Para Toluidine
Peri Acid
Phenyl J. Acid
Phenyl Peri Acid
Phthalic Anhydride

Quinizarine

R-Salt

S-Acid
SS-Acid (Chicago Acid)
Schaeffer Salt
Schoellkopf Acid
Sodium Hydrosulfite
Sodium Metanilate
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INTERMEDIATES

CHEMICAL

The Photographic Record

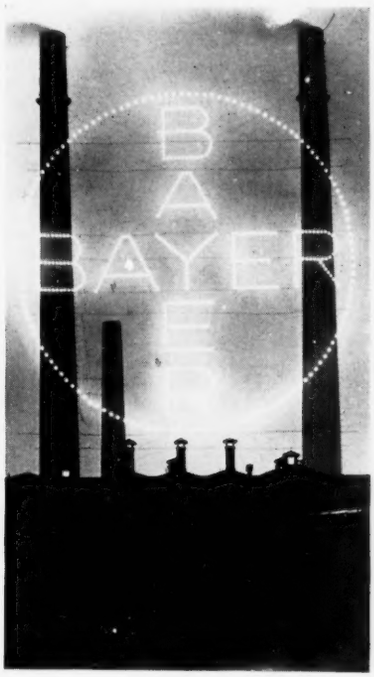
"Portrait of a Child" with which James G. Vail, Philadelphia Quartz, won first prize in the second contest. This portrayal of one of Mr. Vail's children was especially commented on because of the fact that child portraiture is a difficult branch of photography.

The Chemists' Club (New York) recently held a series of photographic contests for the interest of their members and the first of the series was devoted to landscapes and marines. Above is a scene of a "Winter Sunrise" in a Penn township outside of Pittsburgh, which brought second prize to Dr. Harold J. Rose of Mellon Institute.

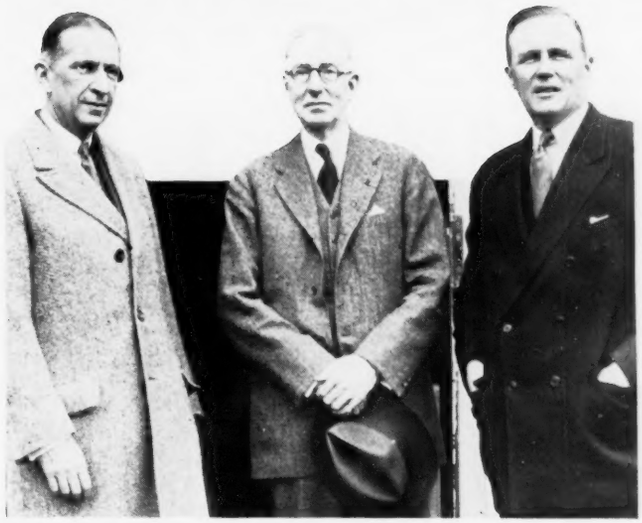
In the first contest, Dr. Arthur D. Little led sixteen other entries in taking first prize for his landscape view "The Head of the Family", Somerville, Mt. Desert, which might aptly carry the caption: "Ever let the fancy roam, Pleasure never is at home."

NEWS REEL

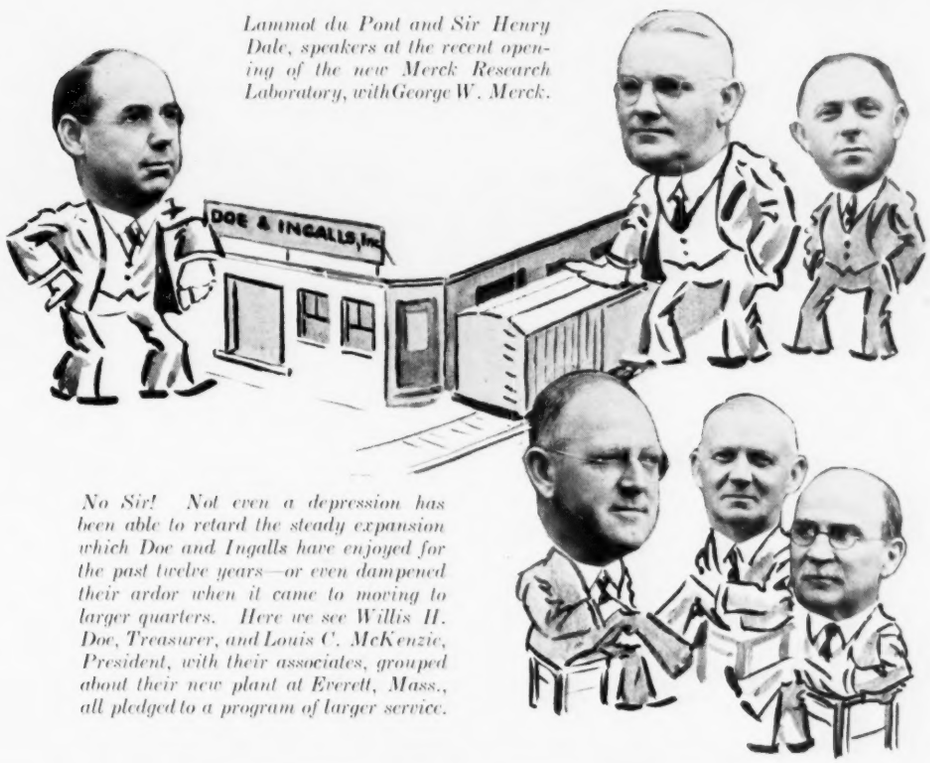
of Our Chemical Activities



Largest electric advertising sign in world, erected by the I. G. at Leverkusen, measures 236 feet in diameter and can be seen more than six miles. The 2,200 bulbs used in the 40 foot letters are suspended on a copper-steel net.



Lammot du Pont and Sir Henry Dale, speakers at the recent opening of the new Merck Research Laboratory, with George W. Merck.

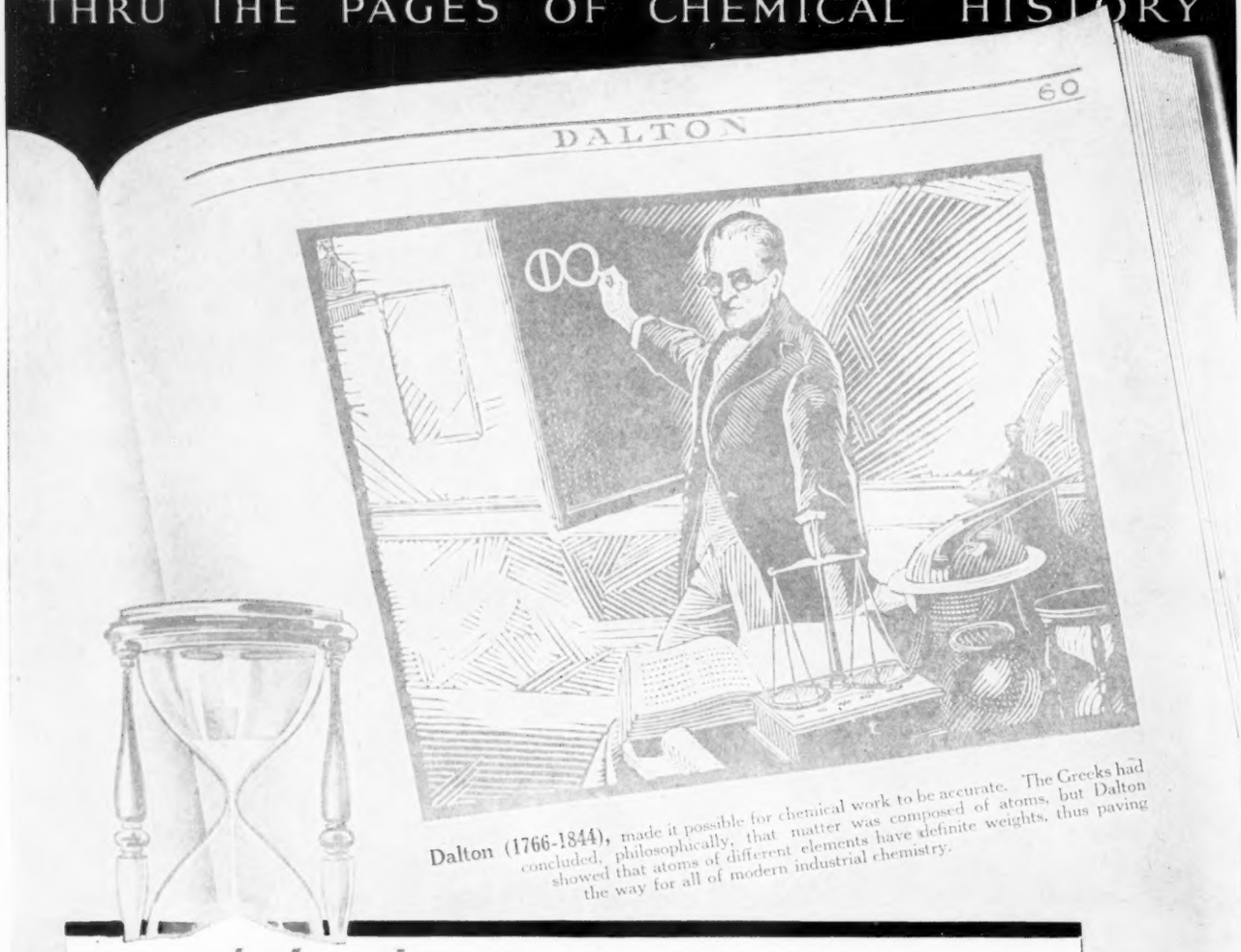


No Sir! Not even a depression has been able to retard the steady expansion which Doe and Ingalls have enjoyed for the past twelve years—or even dampened their ardor when it came to moving to larger quarters. Here we see Willis H. Doe, Treasurer, and Louis C. McKenzie, President, with their associates, grouped about their new plant at Everett, Mass., all pledged to a program of larger service.

H. H. Rosenthal, New York chemical broker, photographed at Osaka, with the partners and staff of Chugai Boyeki Company, importers of hundreds of chemical items for consumption in Japan. At Mr. Rosenthal's right is Utaro Doi, head of the firm (and a Chemical Markets' subscriber), next, T. Yamamoto, another partner.

LEADERSHIP

THRU THE PAGES OF CHEMICAL HISTORY



Dalton (1766-1844), made it possible for chemical work to be accurate. The Greeks had concluded, philosophically, that matter was composed of atoms, but Dalton showed that atoms of different elements have definite weights, thus paving the way for all of modern industrial chemistry.

and to-day

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M. C. A. Activities Reviewed

By Charles Belknap
President, Merrimac Chemical Co., Inc.

SINCE our meeting of a year ago we have witnessed, in the fourth year of the depression, revolutionary changes in our national policy. In an effort to reduce unemployment, increase prices and adjust internal debts, our national government has undertaken, or has now under consideration, a series of bold experiments. These include:

1. Manipulation of currency.
2. Broad use of Federal credit to support our private debt structure during the period of readjustment.
3. Huge public works program.
4. Broad extension of government control over banking, farming, wages and industry.
5. Transfer of the center of finance to the National Capital.
6. An effort for world recovery by participation in the International Economic Conference.

Recognizing that political decisions on many of our fundamental economic and financial problems have a far-reaching effect on business conditions we have felt the necessity of following the course of our national legislation on such subjects as (1) unemployment; (2) the Bills limiting the hours of employment on articles shipped in interstate commerce; (3) a balanced Budget; (4) trends of taxation; (5) depreciated currency; (6) prospective tariff changes; and (7) the industrial control proposal.

The last item is of paramount importance to us all. It has been given a prominent place in the recent discussions of your Executive Committee and of this meeting. It should demand the first place in the considerations of your Executive Committee for the coming year.

In accordance with the expressed policy of your Executive Committee, your Washington Office has largely expanded its *service to individual members.* The widening scope of the Federal administrative, regulatory, and fact-finding bodies renders our Washington Office a necessity rather than a convenience.

Our *Federal legislative service* has kept members advised of the status and progress of Bills affecting the chemical industry. The *General Bulletin,* issued at frequent intervals, outlines significant economic and political trends, in addition to discussing specific items of vital interest to our industry, including the work of your technical committees. A *monthly list of all government publications* touching on chemical subjects is issued, and copies are supplied at cost to members upon request, thus making available to our members the reports of the government investigations and regulations as they are published.

During the past fiscal year 42 States have held regular sessions and in addition many extra sessions were called. Each member receives our State Legislative Report issued up to four times a week, reporting all Bills on chemical and allied subjects and their status.

The large number and variety of State Bills affecting our industry has necessitated our continuous attention. In general we have sought (1) uniformity; (2) avoidance of conflict with existing Federal laws; (3) elimination of freak provisions and of measures placing unsound burdens on the consumer or product. This winter we have through special committees drafted amendments for the assistance of members and local interests, and have taken steps to organize the interested member firms and State interests affected, a task which has called for a tremendous amount of work.

I am going to cite one type of State proposals: many Bills have been offered which would limit the sale of economic poisons to a drug store with a registered pharmacist. If enacted this would break down the existing channels of distribution for insecticides and fungicides and certain chemicals. The limitation of the sale of economic poisons to a drug store is impractical on account of its lack of credit and warehouse facilities, delivery service, and their inaccessibility in many rural communities.

If each State has different requirements on the label and condition of sale it is obvious that a burdensome chaotic condition would prevail. I am convinced that this field of endeavor, in which we have attempted a systemized effort during the past year, must have greater attention next year, as we are dealing with a basic formulation of national policy on the sale of chemical products.

It is difficult to emphasize sufficiently the value of the fundamental and excellent work of our technical committees, which covers the transportation of chemicals, the development of new containers for their safe shipment, safety measures, and consideration of legislative problems affecting our products. These committees are the Traffic, Tank Car, Steel Barrels and Drums, Carboy, Transportation of Miscellaneous Packages and Poisonous Articles, Manual, Insecticide and Fungicide, and the recently created Fumigation Committee. The Minutes of every meeting are available to each member firm. You are doubtless familiar with our close relation with the Bureau of Explosives and with the fact that the Chairmen of our respective committees regularly appear at the hearings

of the Bureau and the Interstate Commerce Commission.

Traffic Committee

The *proposal of the A. R. A. to reduce the mileage allowance* on tank cars of private ownership from 1½ to 1¼ cents per mile involved a potential annual burden of about $115,000 on the chemical industry. Protest from our members resulted in a postponement of action and the granting of hearings on March 22nd. Meanwhile our Washington Office obtained costs of operating tank cars from every known chemical tank car owner. At the hearing before the Board of Directors, Mr. H. M. Mabey represented the M. C. A., which in turn was authorized to appear for the Compressed Gas Manufacturers' Association, The Chlorine Institute, Inc., the Alkali Traffic Association, and the National Fertilizer Association. Subsequently statements were filed with the A. R. A., and we were advised in May that the matter had been indefinitely postponed.

Proposed Supplement to Regulations for the Transportation of Explosives and Other Dangerous Articles. This proposal involved an extension to freight and passenger vessels of the I. C. C. regulations covering the shipment of dangerous articles by freight and express. This proposal was carefully analyzed by the Traffic and Container committees. Our Representatives appeared before the I. C. C. on January 4, 1933, and a statement was filed on behalf of the M. C. A. setting forth (1) the lack of uniformity between the proposed regulations and those now in force for rail shipments; (2) the absence of a definition of "carriers" by water; (3) the fact that if the regulations apply to American and not to foreign vessels a discrimination against American shipping is involved; and offering (4) a protest on the elimination of certain products now permissible on passenger vessels and the omission of others on freight vessels; (5) a protest on the requirement confining to deck stowage many articles which should be kept dry; and (6) a request that privately owned vessels be excluded from the "common carrier" definition.

Container Committees

After an exhaustive study of over two years, a standard 13-gallon carboy has been developed, which has been shown on test to be superior to the three types now in use. The committee is now engaged in testing this new carboy in boxed form, with various types of packing.

Steel Barrels and Drums:

This committee has completed the development of a chromium-nickel alloy drum for Nitric Acid, with specifications. The metallurgical and chemical problems involved were especially difficult.

Specifications for a 5-A lead-lined drum have been submitted to the Bureau of Explosives.

After a three year study an aluminum drum for nitric acid has been developed with complete specifications.

Poisonous Articles and Miscellaneous Packages:

This committee has revised the specifications for one-time-shipper drums; for slack cooperage, and for fiber drums; and has also made recommendations for amendments on the permissive shipment of a variety of chemicals.

Fumigation and Manual Committees

Since its organization in December, 1932, this committee has directed its efforts in large part to state and municipal laws and regulations, with the object of obtaining a greater degree of uniformity and clarity.

This committee has in course of preparation manuals on (1) the filling and unloading of steel tank cars, (2) the filling and unloading of rubber-lined tank cars, and (3) the handling, filling, emptying and storage of glass carboys.

Insecticide and Fungicide Committee

The work of this committee has been especially heavy due to the large number of State Bills affecting agricultural insecticides, one class including Bills restricting the sale of insecticides to drug stores and another covering new State Insecticide Acts. Efforts have been directed toward securing uniformity and the elimination of provisions placing unfair and needless burdens on the consumer.

Last summer nation-wide field tests were run with colored arsenates on a full range of crops, the results of which show the necessity of great caution in the selection of color for agricultural insecticides.

Two unexpected rulings of the U. S. Department of Agriculture have caused a chaotic condition in the fruit industry this season: first, the setting of 0.014 grain of lead per pound of fruit as the maximum permissible residue; and second, the threat of seizure of vegetables showing the presence of fluorine.

In conclusion, it seems inescapable that the coming year will witness many new problems for your Association to handle, entailing additional responsibilities owing to governmental and Legislative activities.

I believe that a year ago witnessed the low point of the depression and that since then we have been climbing and will continue, slowly but surely, to climb out of the discouraging and disastrous times we all have witnessed.

U. S. Imports Synthetic Iron Oxides

During the month of February United States imports of synthetic iron oxides totalled 245,179 lbs., appraised at $9,562, of which amount 51,800 lbs., worth $1,853, came from Canada. Zinc oxide imports were 501,071 lbs., at $21,409, and of this total Canada was responsible for 82,000 lbs., valued at $4,009.

A Program for Tomorrow

By Elon H. Hooker
President, Hooker Electrochemical Co.

A NEW President of the United States has been elected and the people have, on the surface at least, embarked on a new psychology of experimentation and adventure, deeming the fight against continued deflation by resistance a disastrous failure.

The President has shown a willingness to get things done and has started in that direction. Much that he has done was self-indicated and is good. He appears open-minded and glad to be helped. He could not fail to appreciate suggestions from any important group.

Is it not the part of business men, acting through representative organizations, to provide the skeleton of a constructive program in which we can support the President and which we have confidence is best, not for any selfish interest but for the people of the whole United States? Each of us has some such program in mind, well-articulated in some directions and necessarily sketchy in others. To make at least a move in this direction, and with due deference to the many here with far-wider experience in affairs, may I venture to suggest at least the outline of a program which would seem to me to lead us eventually into better times.

I take it we are all in substantial agreement that upward of 90 per cent. of American trade is domestic, and that less than 10 per cent. is international; also, that about three-quarters of the foreign business is in the hands of five or six great corporations and includes one or two staples like cotton. Whatever policy we adopt these corporations will find a way to retain a good share of their foreign business and what they must lose for the better interest of the whole country, they can afford to lose from the present markets without disaster, and perhaps can make up or even increase in the intensified domestic market or in other markets to be indicated later.

Steel production has been at 15 per cent. of capacity. It has just increased to 38 per cent. There have been intimations that it could survive even at as low as 50 per cent. capacity.

There has been recently raised in your minds the question whether fundamental changes were not taking place due to the wider international distribution of machinery which were reducing the volume of international trade and the opportunity of barter. Doubt is raised whether foreign nations recently more highly mechanized will long allow the cream of the machinery business within their borders to remain with the United States.

In some quarters it is doubted if the 1927 to 1929 export business can be regained, or that it would be highly desirable to have it regained.

It is clear that the average American manufacturer and citizen is overwhelmingly more interested in the permanent safeguarding of our domestic market than in the almost negligible per cent. of foreign trade in which he is involved.

We are at the parting of the ways. National legislation to conserve domestic markets and prices is irreconcilable with financial and industrial legislation favorable to international trade. We must choose to conserve the one or the other, and ameliorate, so far as we may, the injury to the interest which must be submerged.

Over 110,000,000 people are living in the great central valley covering 3,000 square miles of territory operating happily under free trade between the States. They are obviously home-minded and largely oblivious of the outside world. Only the Atlantic and the Pacific Coast lines are generally international-minded. It is self-indicated that America must legislate unswervingly for her home markets. From this point we can safely move forward.

America seems to be at least one country which, from its self-containedness, can safely adopt a policy of preserving its home markets. Whether foreign countries can or not is a problem for their individual solution. If each nation develops within its own borders its highest efficiency and its best standards of living and acts with courteous consideration toward other nations, the civilization of the world as a whole will move forward. With the question, whether a super-state will move forward faster, we are not now concerned. I very much doubt it.

To progress on these lines, we should remove at once and on our borders, all foreign influences tending to disintegrate our political, social, industrial and financial morale. Among these I would emphasize immigration restriction and removal of undesirable aliens. The non-recognition of Soviet Russia, as recommended by the last three administrations, follows as a corollary. Recognition would emphasize communistic propaganda, already too prevalent here. Discontinue the campaign to get business there. All the technical and banking assistance we give them only destroys the world market for European nations and ourselves. We should transfer the urge for European trade to intensive competition in the South American markets, the Pacific, and Far East.

The industrial life of the United States is moving from the Atlantic seaboard to the Great Central Valley and to the Pacific West. Political sovereignty also is moving in the same direction. Our natural future outlet will be down the Mississippi, through the Nicaragua and Panama Canals, to the Caribbean countries, South America and to the Far East. These markets belong to our future—Europe is our setting sun. China, India and the Far East use $2.00 of manufactured articles per capita per year. The English speaking countries use $150.00 or more per capita and Japan $20.00. There are close to one billion inhabitants to be reached and a slight increase in per capita consumption would mean prodigious volume.

American Interests Vital

Develop individually owned American built shipping with necessary subsidies, laying emphasis on Coastal, Intercoastal, South American and Pacific lines rather than European lines. Maintain strenuously the open door in the Pacific and Far East areas. Study the needs of our agricultural and manufacturing groups and meet foreign interference with their welfare, their wages, their employment and their standards of living with insulation at the border. Use tariffs freely to protect them and super-tariffs or the threat of correspondingly depreciated currency to meet their depreciated currencies.

Make no vital concessions on the inter-Allied debts but be very liberal about times of payment. Under no circumstance take advantage of the average patriotic American citizen by destroying his first mortgage Liberty Loans, which he bought out of patriotism, in order to make the international bankers' second mortgage, which was bought out of the desire for gain, a first lien, while the average American citizen pays for the whole war. Such moves said to be in the interests of foreign trade, lose their attractiveness when domestic trade becomes the great desideratum.

Enact legislation affecting the issuance of securities in accordance with the spirit of the President's announcement and not on the basis of any legislation yet offered. Revise the Federal Reserve and the banking laws to make the system more flexible and to meet the weaknesses so far developed.

By national planning of railroad operation through a co-operating administrator, avoid duplication of lines, co-ordinate truck, water, air and railroad transportation and relieve roads from unnecessary forced capital expenditures at this time. All should compete on a basis of equality.

Stabilization of industry means the solution of unemployment. So temporarily restrict the operation of anti-trust laws until permanent legislation can be thoughtfully prepared.

Encourage co-operative agreements between sellers to the extent necessary. Labor and capital in action supply the ability to consume, so protection of payrolls and investments is precedent to mass purchasing power and provides the source of taxation. Government intervention may be used to co-ordinate in an emergency, but Government should be the servant, not the master of the citizen.

Unemployment benefits should be voluntary with industry and not compulsory. The National Recovery Bill introduced May 15 is directed to this end and to the construction of public works. Its expenditures for public works should be confined to constructions using directly and indirectly the largest number of workers per annum for the smallest expenditure of capital and should not discourage private construction by payment of disproportionate wages and shorter hours. Since in the long run, most building construction employment must come from the private field, compensation should be not different from compensation and other conditions prevailing on private construction work in the same localities.

Do not build the St. Lawrence Canal. It is mostly in Canada—will help Canadian labor for the most part and we cannot afford to do that now. Do not spend money on the Tennessee project unless to build the Cove Creek Dam which will be self-supporting and help mitigate waste in the Muscle Shoals Dam.

Continue in full stride the recently awakened public opinion at work to force National, State, County, and Municipal expenditures to a minimum. Balance such budgets at a point where they can safely be kept for some years to come.

For the present cease the excessive expenditures for luxurious educational plants; whether useful or not, it cannot now be afforded. Let education be directed to readjusting the present American people to their present form of government, rather than changing the form of government to meet the temporary mood and conditions of the people.

In Times of Peace . . .

Maintain our Army in full accord with the Army Act of 1920 and maintain the Navy in full accordance with the spirit of the Five-Five-Three doctrine as understood by us at the Washington Conference.

Expenditures on the Army and especially the Navy can be made at this time under the National Recovery Act practically without burden of taxation on the American people. This type of construction calls for the maximum indirect and direct use of labor and interferes the least with private enterprise. Not only is it desirable to build to treaty strength but it is almost an ideal use of the public funds for purposes of recovery.

Restore and maintain our usefulness in the World by universal friendliness and scrupulous observance of every contractual obligation—but substitute dignified aloofness for invertebrate sentimentality. Co-operate with the League of Nations in humanitarian matters—do not be otherwise entangled with it.

Transportation Changes Affecting Chemical Industry

By Harry M. Mabey
Traffic Manager, Mathieson Alkali Works, Inc.

THE transportation bill of an average industry, represents a sum which often equals 25% or 30% of its total operating expenditures. The industrial traffic department aims directly at a lowering of the costs of production and distribution, primarily through increased efficiency and the avoidance of wasteful expenditures.

The regulation and operation of our common carriers, as evidenced by the trend of the past ten years, convinces me, more and more, that even the individual gains in the end by recognizing the common interest of the entire industry in the whole transportation machine, its welfare and its ability to function efficiently.

The chemical industry is almost as directly concerned with the rulings and decisions of the Interstate Commerce Commission as are the railroads, themselves. We not only operate under freight rates fixed by this body, but the nature of many of our products is such that their packaging and our very ability to transport them is strictly controlled by regulations, which have the effect of law. The chemical industry, as a whole, has, through the Committees of this Association, been most successful in making these regulations adequate, but still workable, and only through this concentrated effort of the industry, speaking as a unit, can we be assured of a continuance of such satisfactory conditions.

A review of the Association activities of our traffic committees during the past year would seem to indicate that the results sought by the chemical industry are essentially the same as those of the railroads, first, to prevent the destruction of the stability of our general freight rate structure because of fluctuating rates offered by unregulated transportation units. One present effect of such unregulated rates, is, that whenever a railroad chooses to reduce a rate to meet this form of competition, no advance public announcement of the proposed change is made. As a result, industry has no stable relationship upon which to base competitive operations. No positive evidence of the actual rates of these unregulated units, nor of their permanence, is obtainable. Such a condition differs little, if at all, from the days of cut rates and secret rebates thirty years ago. The only remedy is less regulation for the railroads, or more regulation for highway and waterway services. In the latter course lies stability.

Our second effort has been, and must continue to be, to avoid the wholesale cancellation of the many commodity rates moving our raw materials and finished products throughout this territory; rates of years standing, bearing an important commercial relationship, one to the other. The mileage system of rate-making and the long and short haul clause, tends to compel the substitution of a uniform mileage system of rates in lieu of these long-standing competitive commodity rates. Grave disturbances of relationships, and increases in many important rates, and consequently in important operating costs, would certainly result. Our Association joined others in asking the Commission to permit the railroads to postpone such revisions; we have secured a respite until December 3, 1933.

A concrete example of benefit to our industry in concerted action is the recent proposal of the railroads to reduce the allowance paid non-railroad owners of freight cars—in our case principally tank cars. The proposed reduction was 16⅔% or one-sixth, which would, conservatively, have reduced the industry's tank car income by more than $100,000 per year, on a fleet of cars which we operate at a loss. Speaking as an Association we were able to prove, convincingly, that, regardless of operating conditions in other industries, such a reduction, as to our cars, would be most unjustifiable. Action upon the proposal has

been postponed; even if renewed it seems certain that we have prevented this increase in costs.

All present indications would seem to indicate that concerted industry action is more and more advisable —the proposed co-ordination of transportation activities means that our industry, too, should increase its co-operative traffic efforts.

I doubt very much, if, in any appreciable degree, the statement is warranted that our railroad transportation machine is obsolescent. In 1931, this Association, before the Interstate Commerce Commission, predicted that an increase in the measure of the freight rates would not improve railroad earnings, but that the basic need of the railroads was for more traffic, and that if business conditions improved and created more tonnage, the railroad revenues would increase directly and adequately.

This, to me, is still the real factor of change in our railroad situation and is the major cause of their revenue shortage. The history of the last ten years evidences, as everyone knows, that for four or five years after 1923 the great handicap of industry was due to inadequacy of railroad service; lack of equipment and uncertain schedules. The railroads put forth tremendous efforts to remedy this situation; spent great sums of money for the needed improvements. Since then the service rendered by our railroads has been highly efficient and satisfactory. Having created this plant to handle the peak load of our national transportation requirements, the volume of tonnage dropped, over a period of years, to low figures comparable with those of 1921. The railroad plant and facilities remained undiminished, but traffic decreased continuously, and railroad revenues correspondingly, and directly. Tremendous, as was the decline in railroad revenue, the railroads hammered down their variable costs almost in proportion. Their fixed charges and unit labor costs, of course, could not be reduced in like extent.

Cause of Loss in Carriers' Revenue

While in this same period certain traffic drifted away from the railroads to other forms of transportation, such as trucks and waterways, this tonnage, in volume, was not, in itself, the vital factor which caused this terrific loss in the carriers' revenue. At the peak, the railroads, in 1929, produced four hundred and fifty billion of ton miles and by 1931 this had dropped to three hundred and twenty billion of ton miles—about the same as it was in 1921. The two tonnages which have developed at the cost of the railroads, and which have not declined in the depression years, are the tonnages moved by inland waterways and trucks. But the total truck tonnage in 1921 was twelve and one-half billion ton miles, and, in 1931, but twice as much—twenty-five billion ton miles, while the inland waterways produced about ten billion ton miles. This tonnage apparently has found its level. Within two years after 1929, rail performance had dropped one hundred and thirty billion ton miles, four times as much as trucks—and—waterways combined peak—performance.

It is my belief that the railroads have suffered another important concealed loss in tonnage, due to changes in plant locations, etc., directed toward the elimination of freight charges on an important tonnage of raw materials. Another important loss to the railroads, one which is directly related, in my opinion, to the level of the freight rates, is cross-haul tonnage, consisting of partially finished materials which might be completely manufactured in one plant, but which, under favorable transportation costs, often move from one plant, in partially finished condition, to another plant for further processing. Such tonnage movements might be called wasted transportation but nevertheless are of great importance to industry and of even more importance to the railroads because of freight revenue produced thereby, on tonnages which would never be moved at all if the initial plant operation carried through to the finished product. Lower freight rates would encourage such movements.

Fair Rate Making

It is not, however, correct to assume that the railroads have watched this traffic being taken away from them by motor trucks or waterways or plant relocations, without wanting to change their freight rates in an effort to retain such tonnages. A controlling reason existed which prevented them, in most cases, from making the necessary rate reductions. The Interstate Commerce Act and the Transportation Act of 1920 established a new theory of rate making which tended towards stabilizing and freezing the rate structure of the country. It recognized two principles, first, that all the railroads should be maintained as a national necessity. Second, that no level of rates could be devised which would produce adequate revenues for certain weaker lines of railroad, without, at the same time, creating rates which would be excessive in their returns to the stronger lines. This resulted in the recapture clause, whereby it was intended that earnings, in excess of a reasonable amount (6% being the figure originally used), should be set aside, and half the excess returned to the government. This idea proved unworkable and, nearly everyone now urges that this provision of the law be abrogated. It should be, and the railroads allowed to build up reserves in times of prosperity.

The other change in rate making resulted in a common level of freight rates being prescribed in large areas of the country, or rate groups. The number of these groups was fixed at three: one west of the Mississippi River, the other two, roughly, east thereof and north and south, respectively, of the Ohio-Potomac Rivers. The law provided that every locality was entitled to a relative basis of rates and that the rate for a longer distance could not be less than for an intermediate haul within that distance.

The practical result of this was the making of rates, on a fixed level within a territory, graded as to mileage. From this it followed that a change in one rate, on one commodity, necessitated a relative change in every similar rate in the group. In other words, the carriers were not free to make rates that would meet competition only where that competition existed. They had to balance the value of the tonnage they wanted to retain against the loss that would ensue, if rates were lowered on traffic not affected by like competition. In a few words, we may say that the railroads were not able to do business on a business basis; their ability to exercise their managerial discretion was very sharply limited by regulation. Unregulated competitors, however, suffer from no such handicap.

Rigid Regulation Needed

Regulation of all forms of transportation, comparable with present regulation of our railroads, is needed to produce the requisite stability in our freight rate structure. Its effect will benefit industry and, at the same time, will immensely aid our transportation agencies themselves, whether they be railroads, truck operators or users of the waterways. To think that the railroads can stifle such competition is wrong, because regulation prevents. Our railroads should be permitted to operate such facilities themselves, wherever economically warranted.

The above facts, in my opinion, help to show why the level of railroad freight rates is rather inflexible, and, as some claim, too high. While I do not believe that our railroad executives would agree to any such statement, if phrased so broadly, I do think that most would agree that the level of their freight rates, in certain localities and on specific tonnages, is entirely too high. Their problem so far, however, is the practical one, as above outlined of not giving away more than they receive as an offset. If under the present regulatory control they attempt to make competitive reductions, in particular rates, or between two points, they are faced with the necessity of making like reductions throughout a whole territory and breaking down, in an unwarranted manner, a rate structure of extensive application.

In my opinion, the railroads, as a whole, will welcome the federal co-ordinator—whose principal beneficial effect should be to prevent the control of individual competitive influences, whether coming from other railroads or from shippers, and, doing justice to each interest, compel action along lines beneficial to the whole; cooperative arrangements which, under existing laws, the carriers are, in many cases, unable to make effective.

The result should be directly in line with the necessity of the hour, that the tonnage offered be handled in the most economical and efficient manner; that the resulting economies reflect themselves directly in improved carrier earnings; that then the level of the railroad rates be adjusted downward in such a manner as to increase the volume of tonnage moved.

It would seem that the contemplated activity of the co-ordinator, along regional lines, has one very practical advantage over full national government ownership and operation in its promise to bring about lower freight rates. It is conceded that the freight rate level is so high as to limit the movement of certain tonnages. At present the level differs, in different sections of the country, for very real reasons—traffic density, earning power, etc., and the Commission has the power to designate these rate group limits. Under a government-owned, national system, it is apparent that the trend would be toward a uniform mileage rate basis for the entire country; resulting in a definite tendency to dry up existing flows of tonnage and still further localize distribution. The cost of operation of the national system would of course be considered as an aggregate charge; as revenues decreased, all rates would tend to increase. Unless all business is to be localized, strong, privately owned and operated transportation systems are in the public interest. Regulation will adequately prevent abuses—proper competitive interest will encourage the development of the areas served by the respective systems.

Co-ordinator Plan

The co-ordinator plan should be endorsed by industry. Through it, the railroads should realize, short of physical consolidation, most of the benefits of consolidation. The authority delegated to this co-ordinator should tend to bring the railroad industry in line with other industries and make possible rigid economies; it will definitely determine, through impartial investigations, what savings can really be made. It seems evident that only by such direct economies can the railroads so increase their revenues as to permit those general reductions in freight rates which many insist are necessary to bring about an improvement in the volume of general business.

For the first time this year, in the week ending May 13th, revenue freight car loadings exceeded those of the corresponding week last year. Loading of all carload commodities showed an increase, this year's total being 531,095 cars, an increase of 13,835 cars over last year. All districts reported increases save the Eastern (which about equalled last year) the Alleghany and Central Western, where moderate losses appeared in general business.

With the cars-loaded line running steadily upward since the week of March 11th, it has now crossed the downward trend line of 1932, and its upward trend, although on a lower level, is comparable with that of the years 1931, 1930 and 1929—the opposite of the downward trend of the line developed by 1932 loadings, March to August. The railroads, naturally, are hopeful that tonnage will continue to increase, because even a moderate improvement in tonnage will go far towards relieving most of their difficulties.

Putting a Volcano to Work

By the Hon. Senatore Prince Ginori Conti

THE Tuscan "fumaroles" or steam springs have long engaged the attention of scientific observers, though they are comparatively very little known to the general public. Volcanic manifestations, similar in character to those of Tuscany, are to be found in Northern and Southern America, in New Zealand, Japan, Java, and elsewhere; in none of these places, however, have they been regularly exploited, though one or two sporadic attempts were made a few years ago. In Tuscany, on the other hand, chemical products are extracted from the steam of the fumaroles; the gases which accompany its emission have been partly and will soon be completely separated for industrial purposes; while the thermal energy of the steam is transformed into mechanical and electrical power.

The fumaroles are better known by the local name of "Soffioni," from the Italian word "soffiore," which means "to blow," on account of the characteristically hissing sound which accompanies the emission of the volcanic steam. As a consequence of the discovery in 1777 by the German chemist, H. Höfer (who had proved that boric acid was contained in the water of one of the pools through which the steam rose), the manufacture of borax was attempted by combining boric acid with soda. The extraction of boric acid, however, was not begun regularly until 1818, by Francois de Larderel, hence the name of Larderello given in 1847 to the first of his works. The boric industry from that time has been continued without a break in Tuscany; it was exceptionally prosperous during the first 50 years, when Tuscan boric acid was practically without competitors in the world's markets. In 1827 Francois de Larderel had the brilliant idea of using the natural steam as a heating agent for concentrating boric solutions, and he was thus enabled to dispense with wood fuel, the expense of which heavily handicapped him. This was the first step towards making use of the thermal energy of the volcanic steam springs. Almost a century was to elapse, however, before anything further was done in that direction. Another

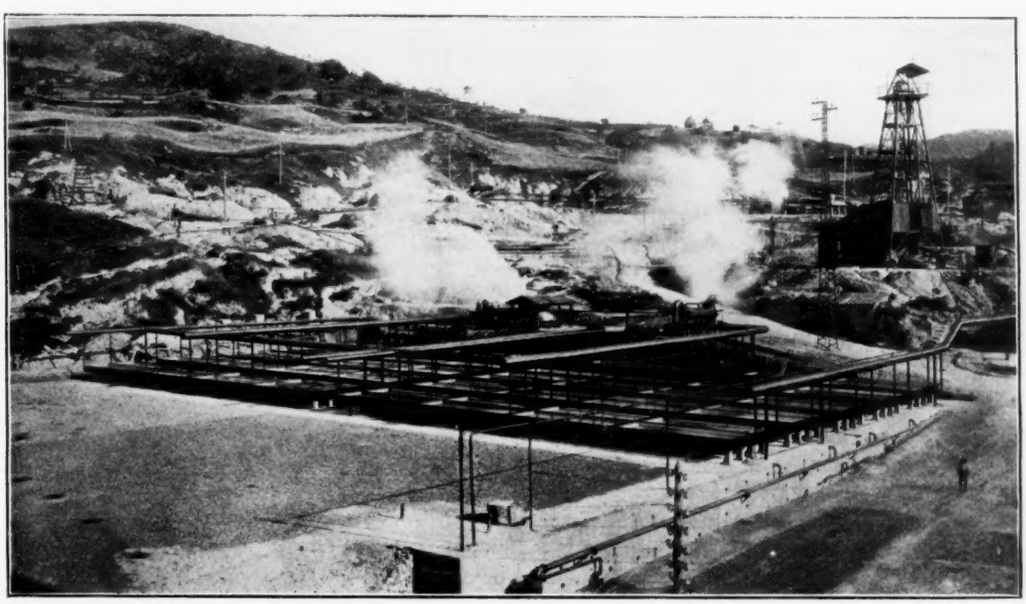
General view of operations at Larderello Borax works.

important feature subsequently introduced was that of drilling boreholes in order to obtain boric waters and steam. Without this it is doubtful if the industry would have achieved the brilliant results which raised it to the prosperity it long enjoyed.

When I was entrusted, in 1904, by my late father-in-law, Count Florestano de Larderel, the grandson of the founder, Francois de Larderel, with the general management of his works, the Tuscan boric industry was passing through a difficult period owing to the formidable competition of borax derived from the recently exploited American fields. Count Florestano de Larderel, understanding the crying need of improvement, began by erecting at Larderello a borax manufacturing plant (1884), and subsequently a refining plant for boric acid (1890); this was only a first step, however, and far more was necessary in order to cope with the growing competition which threatened the future of the industry that had supplied boric acid to practically the whole of Europe and America during almost half a century.

My first efforts had to be directed toward improving existing methods. Ever since my first visits to Larderello I had been struck by the fact that precious thermal energy was being wasted. First, it was essential to have trustworthy data as to the composition, pressure and temperature of the Soffioni steam. These data were obtained under the direction of the late Professor Nasini, one important fact established being that the Soffioni steam is superheated. Professor Nasini's work was encouraged by the late Dr. Ludwig Mond.

My first efforts were devoted to the chemical plant for the manufacture of boric acid, borax, and the recovery of ammonia (first by fixing it as ammonium sulfate and later as ammonium carbonate), etc. But I was determined to make use of the steam of the Soffioni as motive power. The results of my first experiment were entirely satisfactory; soon after a larger plant was erected, again using a cylinder



Boric acid concentration tanks at Larderello works.

engine. When, in 1912, it was decided to take a greater step, the steam turbine was adopted. The presence of the incondensable gases associated with the steam (about 6 per cent.) would have handicapped the condenser plant. For this reason it was considered advisable to give up the idea of feeding the turbine with natural steam, and to use this instead as a heating agent in evaporators for generating pure steam for feeding the turbines. Such was the system adopted for the 250-kw. turbo-alternator, which began working in 1913, and was followed almost immediately by a much larger installation consisting of three units of 3,000 kw. each, thus completing my first important power plant at Larderello, which was erected between 1916 and 1917 in spite of many difficulties arising from the war. The condensers were later transformed from surface into jet condensers, thereby abolishing the tubes. The working principle of the boilers now consists in a continual condensation and successive re-evaporation in a separate chamber of the Soffioni steam, the result being that the gases are almost completely eliminated, being let off from the first (or condensing) chamber, while the steam issuing from the second (or re-evaporating) chamber contains only a slight proportion of these gases, having, however, as a natural consequence decreased slightly in pressure. Since the alterations mentioned above, the original plant at Larderello, with its three condenser units, has been running regularly

At the present moment our plants comprise the following machines: Larderello—3 units of 3,000 kw. of the condenser type; 1 unit of 3,000 kw. of the free exhaust type. Castelnuovo—2 units of 750 kw. free exhaust type. Serrazzano—1 unit of 650 kw. free exhaust type. Lago—1 unit of 250 kw. condenser type. The total power realized at our various works averages 14,400 kw. Somewhat wide use is made of aluminum in the place of copper, wherever the substitution is feasible; this is on account of the corrosive action of sulfur dioxide (another of the constituents of the gases carried by the Soffioni) on copper. Three-phase current is generated at 4,500 volts, 50 periods frequency, and transformed up to 16,000 and 40,000 volts for transmission lines. The completion of the Larderello power-station, by the installation of the fourth unit, took place at the end of 1930, and an order had been placed just about that time for a new drilling machine, as I was resolved to attempt to bore wells of greater depth and diameter than those formerly obtained.

The results of the first well drilled with this new equipment were impressive. On March 26, 1931, after several months of work, our skilled foremen perceived, by some warning signs as to the nature of which their long experience could leave no doubt, that steam was about to burst forth, and that it was prudent to seek refuge in order to avoid the dangers of an explosion. A few moments later the explosion occurred, and resembled even more than usual a small volcanic eruption. After expelling stones and mud, the well settled down to emitting steam in torrents and with a deafening noise which went on for weeks—that is to say, till the upper end of the casing, with its valves, was fixed in place. On April 20, 1932, a second large well was completed. The total output of steam from all the wells at our various works can be estimated now at over two million pounds per hour.

Boric acid occupies the place of honor among the products of our chemical department. The crude acid we are now putting on the market is of 95 per cent. grade. The time-honored evaporating pans are being gradually replaced by new apparatus, whereby economy of space and far greater efficiency will be obtained. Considerable improvements have also been introduced in the refining plants which allow the mass production of pure acid up to B. P. standard. Borax is manufactured at Larderello, using boric acid and sodium carbonate, and the old plant has been recently brought thoroughly up to date in order to meet all requirements. Special boric products, such as calcium borate, magnesium borate, and sodium perborate, are also manufactured; and also various toilet specialties—namely, boric talcum, boric and borax soaps, and so on.

Another product, steadily growing in our industry, which is contained in the volcanic steam, is ammonia. Repeated experiments for the separation of ammonia from the Soffioni steam before its further utilization have led now to extremely simple and efficient devices which make this feasible.

Other Proposed Chemical Manufactures

About 92 per cent. of the gaseous mixture accompanying the Soffioni steam is carbon dioxide. The proportion of gas to steam is about six per cent. by weight at Larderello, so it is clear that enormous volumes of carbon dioxide are available. Other components of the gaseous mixture are: sulfur dioxide, methane, hydrogen, oxygen, nitrogen, and small proportions of rare gases—namely, argon and helium. The industrial utilization of these gases has been studied during several years at our works, and much laboratory work has preceded its practical realization. The first step was the separation of carbon dioxide, and a large plant has been erected for that purpose at Larderello, where it has been running now for some years. The gas is first entirely freed from sulfur dioxide, and subsequently compressed. Quite recently we have inaugurated a plant for manufacturing dry ice. Sulfur dioxide will be turned to account for the production of hyposulfites and sulfites. We have already separated methane, and hope to make this gas the source from which to obtain several interesting carbon derivatives.

The separation of hydrogen, nitrogen, and the rare gases will be effected by means of apparatus which is in course of erection. Of the rare gases, helium is the one which more especially claims our attention. The radium emanation has been accurately estimated, and is still under laboratory observation.

Ounces to Tons

By George C. McCarten

EVERYONE nowadays is working his brain overtime to devise new ways of doing the old job and to find new products which will relegate present products to the scrap-heap and it is of vital importance to every company to select from the multitude of new ideas presented for consideration, those which are of real value and to develop them commercially. The companies which do this task most successfully will be the leaders in the years ahead. This article will cover a method for the procedure involved in going from ounces to tons, from flasks to tank cars.

Good ideas may come from an alert salesman who sees where a market may be developed or from one of the technical staff who visualizes a new way to utilize present products or existing facilities of his organization. Many ideas are sponsored; the first task is to roughly sort out the most promising ones so that the development appropriation may be expended to best advantage.

In the initial consideration of proposals, the following tests are of value:

1. On the basis of small scale laboratory work does the proposal look sound chemically and is the method proposed apparently economical?
2. Does it appear that there will be a reasonable sales demand for the product if successfully developed?
3. Does the proposition infringe existing patents, etc.?
4. Does the proposal fit in with the present lines of products and trade relationships of the company? If not it must be exceptionally promising to warrant the extra cost of developing in an unknown field.
5. Do the prospective returns warrant the probable cost of developing the proposal?

It is of course realized that the final answer to these questions rests on work ahead; but these tests will eliminate many of the weak sisters which often eat large holes in development appropriations.

When preliminary checks have established the belief that there is a fair chance of getting somewhere with the idea, it is then in order to find out how to make the product commercially and to determine the merits of the process. To the business man it may seem strange that competent men cannot figure out the answers at their desks. However, experience shows that it pays to get specialized knowledge, discover "bugs", and pull "boners" on a pilot plant setup for each project. In the course of pilot plant development, the organization secures the information which enables it to correctly evaluate the merits of a project. A properly handled pilot plant saves time and money in the end, and the only appreciable sums of money the writer has seen wasted on pilot plant experiments were spent on hopeless propositions which should have been discarded by preliminary examination before they got to the pilot plant.

The size and scope of experimental apparatus needed varies with each project. The two cardinal points on this matter being that sufficiently large batches must be put through the pilot plant to determine how the reactions work commercially and to determine the deportment of the materials handled during the reactions. In other words, one must find out if there are any side reactions which have escaped notice in small scale experiments that take place in commercial batches with their different time and heat conditions. Also what mechanical difficulties arise with large batches in handling, agitation, frothing, heat transfer, etc.

While the pilot plant work is in progress, the Research, Production, Engineering and Sales staffs make contributions of vital importance. The man heading up the development must understand the language and points of view of each of these groups and must work effectively with each group. It is a real test of his mettle to secure, utilize and harmonize the talents and suggestions of each group and obtain the information needed for the effective functioning of each group. The measure of the development man's work comes when plans are drawn for the commercial unit. If his work has been well done the organization escapes most of the heated conferences and arguments about things which do not exist arising from failure of specialists to understand other specialists' language. Much time will be saved, and most important of all a proposal can be submitted which utilizes the talents of the organization and on which all groups are in accord.

While the pilot plant work is in progress the Research and Development staffs must critically judge the development. Primarily, they must learn how to make the product and the conditions and limits under which the process is workable. Investigations must be made to insure against infringing existing patents. Also great care must be exercised to make sure that the process adopted is the simplest and most desirable way to reach the goal. This information will be used in securing patent protection, to cover the cost of pioneering and particularly to make progress difficult for the chiselers, who will try to come in through the back door, once the market possibilities of the new or

improved product are established. The approved chiseling method of certain companies is to develop projects by buying competitors' men and skinning around the valid claims in competitors' patents. Accordingly, on promising developments, it is essential to carefully develop the fundamental conditions controlling the process and exercise great care to see that the conditions so established are embodied in the claims of the patents applications on the development.

Plant Design

As progress is made on development through the pilot plant, commercial size samples become available for test work both in the company's laboratory and by the trade. From these tests a measure of the probable market is secured by the Sales organization, information is secured on the location of plants which will use the new product and product specifications may be established.

With the marketing information at hand it becomes possible to reach a decision on the general design of the new plant, covering whether it will be continuous or batch operated, one shift or three shift, single or multiple unit, and what provisions must be made for future expansion.

The Engineering staff observes developments, studies the operations involved, decides what types of equipment are needed, and learns what materials of construction withstand the special corrosion and contamination requirements of the new process. They must determine how much power, steam, fuel and water are involved. They must investigate what special requirements will be placed on the process equipment due to fire and explosion hazards, corrosive or poisonous dusts and gases, etc. This data enables the Engineers to present preliminary plans for discussion with the operating men, who will be responsible for ultimate production of the new product.

The production men are particularly concerned with the material handling methods, operating conditions, safety appliances and equipment layout. Since they are going to sit up nights with the new baby, they are entitled to have their say on how the unit will be designed, and a lot of time and effort will be saved if they get in their changes on preliminary plans.

When the Engineers and production men have gotten together on the general layout of the job, it is essential for the Research and Development men to check over their proposition and do such further investigation work in both the laboratory and pilot plant as is needed to make sure that their proposal falls within the limits of the process. Also to check the performance of materials of construction under conditions approximating those to be met in practice. If the development work has been thorough, this final check will be rapidly completed. The reason for the final check is to make certain that in the transition from the hundred pound batches of the pilot plant to the tons of the commercial unit that no new factors have come into the picture, to cause trouble in the commercial unit.

While this final check is going on, the Engineering can proceed with the detailing of the special pieces of process equipment, securing data on heat and pressure effects, agitation required, trouble from shut-downs, etc. from the pilot plant data. Control arrangements are selected, provisions made for minor repairs and replacements, and the general arrangement drawings are blocked out as soon as there is full accord on the project. The probable cost of the plant is determined and the Engineers' contribution to the development is completed, until the proposal is approved for construction when they will make detail drawings, draw up specifications, requisitions, etc.

Calculation of manufacturing costs are now made to determine the merits of the proposal commercially. Labor costs are estimated by study of the equipment layout and knowledge of similar operations. Depreciation and Maintenance charges are set up on the basis of both pilot plant results and general company experience. The costs of power, fuel, water, etc. are set up on the basis of Engineering data. Material charges are based upon pilot plant data. The necessary additions are made for overheads, packaging and the like, and probable costs arrived at which can be reported to the management with confidence.

Developing a Project

There are many ways of developing a project. This article merely professes to be the writer's idea of a good method of procedure. The writer believes, however, if this general procedure is followed by competent development men it leads to the following desirable results:

1. It eliminates the weak sisters at a minimum cost, regardless of their sponsorship.
2. It utilizes the available talents in the organization, clarifies their hunches, satisfies their doubts and tends to secure a proposal that meets with general accord.
3. It tends toward adequate patent protection of the development.
4. It tends to enable the organization to present a recommendation for building a new plant with confidence that the whole proposal is sound, that the proposition is workable and sound chemically, economically and of efficient design. So if money is appropriated for the project, the whole organization can feel confident that there will be a market for the product, that no other outfit is going to snatch away that market by producing a more efficient process, and that the company will have patents to protect it against the chiselers.

If the management grants an appropriation for the projected plant, the detailed engineering work and

actual construction are carried out, and the plant started up with the Development and Research staffs responsible for its performance until it produces one grade material at rated capacity. The production staff then takes over the plant as a satisfactory unit and the organization has successfully translated another development from ounces to tons.

The prime object in a new company development is to make profits for the company. The real reward for the development men comes in seeing the new product profitably marketed in a form buyers may use to advantage.

Origin of Chile Saltpetre

In a recent issue of *Chemiker-Zeitung*, Dr. C. T. Kautter describes observations made of climatic conditions in Chile, which he believes may throw an interesting light upon the origin of the saltpetre deposits.

In 1924, Prof. Stoklasa suggested that the formation of these beds might be due to a combination of volcanic and bacterial action, the latter being catalyzed by radioactivity. In support of his views he investigated a series of samples of caliche in which he was able to determine the existence of 80 x 10^{-12} gm. radium per gram of mineral. That not only the deposits themselves but also the overlying atmosphere should exhibit radioactivity appears to Kautter to be probable though unimportant. He brings forward the suggestion that the formation of nitrates can be explained by well-known physico-chemical changes which are independent of radioactivity.

The district of northern Chile in which the nitrate is found is undoubtedly volcanic in character and the vastness of the deposits and the absence of characteristic fossils have led to the abandonment of the idea that the caliche is of animal or vegetable origin. The violent thunderstorms which occur with great frequency in the high mountains in the summer are accompanied by discharges at such high potentials that the conditions for the production of nitric oxide are most probably fulfilled. Further oxidation of this gas to nitric acid and its subsequent action upon the common salt which is abundantly supplied by volcanic action would lead to the formation of sodium nitrate, but the transference of the latter to the nitrate zone, some hundred kilometres farther westward, is not so easy to comprehend, for the geological evidence seems to be against the idea of transference by sedimentation.

Now it has perhaps not been sufficiently well recognized that the nitrate zone, which extends about 100 km. inland from the coast and lies between lat. 19° and 26° S., is particularly subject to the visitation of immense cloud-banks of fog, which rise almost vertically to a height of about 1,000 m. against the coastal heights before being carried inland. Close observation has shown that these banks of cloud operate only within a limited and fairly well-defined area, with its centre at the coast and extending to the prairies or pampas, which lie at distances varying from 30 km. to 80 km. from the coast-line. It is significant that the greatest accumulation of cloud is to be found overlying the zone which is richest in caliche. Now these thick clouds, which often hang for long periods over the nitrate zones, may serve as transporters and condensers of the oxides of nitrogen which are formed by the frequent electric discharges. It is also suggested that nitrogen may become activated during the evaporation of the water, though this has not been experimentally verified.

Good deposits of caliche are frequently found not only in the valleys or plains but also at overhanging cliffs on the mountain-sides, wherever any resistance to the flow of the cloud may be offered. These arrested portions of cloud are eventually dispersed by the sun, when the nitric acid is deposited. Further confirmation of this theory is to be found in the fact that isolated deposits of caliche can be traced to the breaking away in certain areas of patches of cloud which drift away from the main areas of concentration.

Thus the deposits of nitrate are formed by the gradual evaporation of the clouds in the enormous basins in the mountainous regions. Even the relatively high concentration of iodine in the caliche, which has sometimes been quoted as evidence in favor of its production from organic remains, can be satisfactorily accounted for on this theory. The iodine content of the air is particularly great at the sea-level. It is stabilized by oxidation by ozone and nitrogen peroxide to iodic acid. Thus the author draws the interesting conclusion that in this case Nature adopts much the same process as that in operation in modern technology, namely, the combined action of water, air, heat and electricity.—

Germany Returns to Italy and Spain for Mercury

With dissolution of the Italo-Spanish mercury cartel last year, producers in those countries apparently have regained command of the important German mercury market, according to German import figures for 1932. In 1928, when the cartel was formed, Italian and Spanish mercury formed 82.5 per cent. of the German imports, from which the proportion rapidly dropped to 55 per cent. in 1931, with total imports declining at the same time from 1,328,100 kilos in 1928 to 337,900 in 1931. Mexico and the United States gained most from this movement; together they filled 3.1 per cent. of the German demand in 1928, 19.6 per cent. in 1930, and 18.1 in 1931. In 1932 the effort to maintain high prices by cartel methods was abandoned, and the trade movement changed. German imports of mercury rose to 357,200 kilos during the year, of which 71.5 per cent. came from Italy and Spain. North America contributed only 7.5 per cent., all from Mexico, and none late in the year.

The fact that Italian and Spanish recovery of the German market was due to reduction of prices is indicated by the sharp drop in average valuation of the German imports—only 5.36 reichsmarks per kilo in 1932, compared with 10.92 marks in 1931 and 13.34 in 1928.

Liquid Oxygen Explosives

The liquid oxygen system of blasting was adopted by Germany during the late war in order to conserve supplies of nitrated compounds for military purposes, and though, owing to imperfections in the old carbon cartridge, the use of nitro-glycerine was reverted to after the armistice, the improvements effected in the plants for manufacturing liquid oxygen, also in transport containers, dipping vessels and the cartridge, have led to the commercial development of liquid oxygen explosives in Germany, France, United States of America, South Africa, India, etc. In the iron mines of Lorraine, France, the number of Weber cartridges used increased from just over 600,000 in 1919 to close on 11,000,000 in 1930, and practically the whole of the blasting is now by the "Weberlox" liquid oxygen system. Apart from monetary savings, the attractive features of liquid oxygen explosives are elasticity in application, safety in handling and absence of noxious fumes. The modern form of the Weberlox cartridges is made of combustible materials, such as sawdust, cork and metallic powders, wrapped in paper coverings, all of which are inert substances. The cartridge is manufactured in sizes ranging from 4 in. to 12 in. in length and 1⅛ to 1½ in. in diameter. It is not explosive until it has been soaked in liquid oxygen, and this does not take place until just prior to the blasting and only at or near the working face. The life of the charge does not exceed half an hour, which means there can be no danger from misfires. The cartridges are ignited by electricity or by safety fuse.

Thoughts on PROFITS

By Charles F. Abbott

BUSINESS exists for making profits. When profits disappear, business likewise disappears. The satisfaction of labor working for an adequate wage, of the consuming public for an adequate supply of goods at reasonable prices, of the investor for a return on his money, of the government for an unimpaired source of tax returns, are all dependent uniformly upon the profitable operation of business. This problem of earning a profit, however, is properly left to the discretion of business management. Consequently, management is in duty bound to apply scientific thinking and planning in effecting better methods for the stabilizing of business prosperity.

Every business enterprise is fundamentally a public service undertaking. It can make good and should be allowed to exist only in proportion as it recognizes the public character of the function it is performing. Uniformity of prices and of the treatment of customers until the time comes when there is reason for a uniform change, with full publicity for the change, is the course upon which the interests of all can be reconciled —and the only one. Business men must recognize the need of eliminating the destructive competitive practices, such as price cutting, that destroy profits and incur losses when goods are sold below the cost of producing them.

The profit record in most of our basic industries, such as oil, coal, lumber, metal, textile, rubber, food and others has been anything but encouraging. We have been dissipating important natural resources at a loss.

Goods that must be sold at a loss, represent so much capital and labor thrown away. Distress sales inevitably result in a curtailment of industrial activity and unemployment. When industry is profitable, labor is profitable, and these profits are spent for goods. When industry is unprofitable, labor is thrown out of employment and consumption is reduced, thus causing a vicious circle.

We can do much more with the agencies we now have and without upsetting the capitalistic principle upon which our business is based. We must look beyond immediate orders and prices. We must throw overboard any faith in unsound or artificial agreements, designed to control such fundamental, economic forces as orders and prices. It is a fallacy, during times like these, to attach any hope to any system of compulsion designed to divert world-wide influences.

I personally do not believe the Sherman Law, or any of the anti-trust statutes since enacted, prohibits that form of trade cooperation that is essential to achieve these ends. But the interpretations given by some political office-holders under those laws are such as to make the effort decidedly hazardous.

Many organizations have been studying the problem for the past two or three years. As a result of these studies the feeling prevails that a slight modification of the Anti-Trust Laws, to permit the control of production output in accord with consumption demand, be applied to our natural resource industries. That would prove helpful and without impairing public welfare.

Stabilization of these industries would conserve natural resources and would undoubtedly develop a constructive influence over all other business enterprises.

The day is fast arriving when the public will realize more fully the fundamental necessity of insuring us against bankruptcies and of improving the profit standing of those who engage in business. Politically, we are just awakening to the fact that if we desire to organize trade and industry, to maintain the wage scale and employment, it is necessary to permit trades and industries to earn reasonable profits.

The lesson of cooperation as advocated by the trade organization has prevented many a costly price war that otherwise would have proved expensive and disastrous for the entire industry. Without the trade association there is no assurance of a normal stability of an industry. An instance so small as the releasing of a destructive cut price policy, usually inspired by some imaginary grievance and by a single company, will kindle the flames of bitter retaliation and all the evil consequences of greeds, animosities, hates, and jealousies.

Our strongest weapon is education. By hammering indisputable facts home again and again to every member of an industry, the influences, that promote price cutting can be reversed. Education should start by destroying the illusion that greater profits can be obtained from an increase in volume secured by price cutting. When this illusion has been destroyed, the root of the price cutting evil will be eliminated.

We can do much to effect this education through co-operation, through coming together and honestly discussing our problems. Around a conference table, in trade association meetings, this education is possible and without circumscribing the rights of individuals.

But, the more permanent, outstanding accomplishments of trade associations are those programs that were designed to meet the external problems of an industry and that included a direct approach to the

market for the industry's output. Research to develop new uses and new applications, market analysis, the protection and extension of existing markets, education and many other similar activities that might relate to distribution, costs, and public welfare all reflect the broader and more effective schedules of the progressive trade association.

The direct approach to better prices and insured profits is through an increase in consumption that would more nearly approach the ability of the industry to produce.

It is easy to understand why so many executives attach less importance to co-operative activities directed toward the market than to those internal questions that relate to prices and competition. Many of them have received their early training in the plant or factory. They became and still remain production-minded. They were efficient in dealing with machines, formulas and problems of output, things that could be fixed and easily controlled. But when they approached the market they immediately encountered an entirely different situation.

It is a long way from the plant to the market and yet if a business is to endure, it must sell at a profit what the plant can produce.

Executives have usually approved large appropriations for plant improvements, but when the call came for market development and for market research the objective, to them, was too vague and too indefinite. Unlike machines, brick and mortar, the results could not always be measured. Appropriations for market promotion were too often refused or reduced to a point where they became ineffective.

Managements were willing to pay for buildings and machines to increase production. That part of the program has now been overdone and many of these plants are now starving for something to do. The old idea was that orders just happen, that they seek the well equipped plant. They were anticipated, just as the sun was relied upon to appear each morning in the east and it costs nothing to see the sun. That has been one of our greatest faults. Money flowed into plants and equipment while but a very small proportion ever found its way into plans to develop a market.

Starvation of Machine Age

The comparatively rapid depletion of the earth's available resources in this mechanical age was considered by Prof. R. A. Gortner, of the University of Minnesota, in a paper before the American Association for the Advancement of Science in December (Science Service, Washington, D. C.). It is pointed out that irreplaceable stores of natural resources absolutely essential to modern industrial civilization are disappearing into the "maws of industry" and so wastefully dissipated over the earth. While the publicity of technocracy directs attention to the part played by mechanical energy in remaking economic conditions, the shelves in some of Nature's cupboard are showing signs of exhaustion of the materials necessary for a mechanical age. In particular, Prof. Gortner mentions the approaching exhaustion of copper, antimony, tin, lead, zinc, chromium, manganese, nickel, and iron, which are stored in parts of the earth accessible to man. The rate of use of some of these metals is doubling each decade. We still use tin-foil for wrapping up sweets and cigarettes. At the present mining rates, iron will be exhausted in Germany in about fifty years and in the United States in about a hundred years. The United States sulfur supply will fail in fifteen years; the coal of Germany in less than a thousand years and of the United States, notwithstanding its huge lignite deposits, in less than fifteen hundred years. It looks as if the machine age may starve to death before long, a victim of today's profligate use of metals, coal and oil. Water power, alcohol from vegetation, solar energy, etc., are at present totally inadequate to replace oil and coal. Will future civilizations look back upon the industrial civilization of the twentieth century as an age of robbery?

British Chemical Industry

British chemical industry has emerged from the third year of world-wide trade depression in a relatively satisfactory position, and is making every effort to consolidate the advantages gained during 1930 as a result of the depreciation of sterling, the adoption of a protective tariff policy, and the preferences obtained in Empire markets following the Ottawa Conference. This relatively favorable position as a whole is indicated by the overseas trade figures, which showed a slight increase in the chemical index for the whole year of 1932—97.7 compared with 95.2 for 1931, and by the decrease of more than 10 per cent. in unemployment. Insured workers in the industry number about 99,000, of which 16,020 were unemployed at the end of 1932 compared with 18,091 at the end of 1931.

Linseed Oil Fires

Spontaneous combustion of linseed oil, even at times under conditions which appear highly unfavorable to the phenomenon, is fairly well known. It often occurs when the oil is merely in contact with damp wood in open air, despite the continual surface cooling; and the risk is still greater with linseed-oil varnishes containing metallic driers, and more particularly if turpentine or other volatile material is present. Tung oil is probably worse than linseed oil in this respect. Mineral oils are also liable to this risk to a certain extent, and it is often increased by the presence of pigments such as the chromes, ferrocyanides, lead oxides, etc.

Various causes or predisposing conditions tending to spontaneous combustion of linseed oil or linseed-oil paints are: (a) high drier content; (b) temporary stoppages of the roller mills under circumstances favoring spontaneous combustion; (c) extreme fineness of the pigment and catalytic action of impurities in the pigment; (d) atmospheric moisture; (e) considerable development of heat in roller mills working under high pressure, with probability of friction setting up chemical action; (f) ineffective cooling arrangements.

Paris or Prussian blue is specially liable to set up spontaneous combustion, the more so when it contains small amounts of sulfur or residues of oxidizing agents such as potassium chlorate. The blue in this case is converted by burning into ferric oxide. The consequent setting free of cyanide and water in the presence of atmospheric oxygen adds considerably to the heat evolved, so that any oil present, linseed or the like, is completely burnt. One method of avoiding this fire risk in the case of blues is to select these very carefully, and subject them to a combustion or firing test with an electric spark; the one which glows most quietly and slowly is the safest and least liable to spontaneous combustion. If it is necessary to use blues more liable to the fire risk they may be advantageously mixed with a certain percentage of zinc white or heavy spar.

New Products and Processes

Textile Bleaching with Peroxide

In bleaching vegetable fibres with alkaline peroxide bleaching liquor, the acids formed by oxidation of impurities gradually neutralize the alkali present, and the liquor becomes acid. Acid has a stabilizing effect on hydrogen peroxide, consequently the bleaching process stops. Addition of larger quantities of alkali with a view to preventing the change frequently results in attack of the fibre itself. Sodium oxalate is hydrolyzed in hot solutions, and in the presence of peroxides the hydrolysis is accelerated, and part of the oxalic acid is oxidized to carbon dioxide, so that the mixture becomes alkaline. The addition of sodium oxalate to a peroxide bleaching bath would therefore be expected to prevent acidification of the liquor and to intensify the bleaching action.

In practice, it is found that the liquor containing sodium oxalate turns acid more rapidly than an ordinary alkaline liquor, but the bleaching process continues even in the acid medium. This is explained by the fact that the sodium oxalate is absorbed by the fibre, and reacts with the hydrogen peroxide while in this state, producing an alkaline zone in the immediate neighborhood of the fibre. The bleaching action is then more rapid and more thorough than in the ordinary bleaching process. An intense souring is necessary in order to remove absorbed oxalate from the bleached material. The bleached products have been found to have low copper numbers.

Colloidal Copper as Fungicide

A colloidal copper which appears to have considerable promise as a fungicide has been developed. While the results up to date are encouraging, the experimenters feel that one more season's work is necessary before the use of the material can generally be recommended and the new fungicide will be given a thorough trial in a season of normal temperature. Should this material be safe under these conditions it is expected that the article will prove a valuable aid to the fruit grower in his efforts to control insects and disease.

Malodorous Gas

A method has recently been patented in Sweden for removing the malodorous substances, such as hydrogen sulfide and mercaptans, from the waste gases in the manufacture of sulfate and alkali cellulose. The gases are cooled or saturated with water until the dew point is reached, and are then treated with an alkaline aqueous solution or emulsion of hydrocarbons of the terpene or camphor group or addition compounds, or derivatives of such hydrocarbons. The treatment is carried out under reduced gas velocity (0.5 per. sec. or less) and can take place under reduced, atmospheric, or slightly increased pressure. Before the absorption treatment the gases liberated by the boiling and gassing, etc., of the cellulose digesters are purified by absorption in alkaline liquids, and are then conducted to the alkali-recovery plant, where they are burned and collected with the other smoke gases from the smelting furnaces, soda furnaces, etc.; then the total gas mixture is subjected to the treatment described for removing the residual content of hydrogen sulfide, mercaptans, and other ill-smelling substances.

Liquid Oil Bath

Presenting many advantages over the oils hitherto in use, as well as glycerine and sulfuric acid, an improved liquid for oil baths is spoken of abroad. Apart from complete immiscibility with water, which insures almost immediate evaporation of any drops of water which may happen to alight on the surface, the new liquid is non-inflammable, the vapor functioning as a flame extinguisher. The unpleasant and dangerous frothing of ordinary oils on contact with traces of water, and all risk of fire, are thus avoided. The oil can be kept for an indefinite period at a temperature of approximately 220° C. without undergoing any change whatsoever in the shape of resinification or thickening. When taken up to 250° C., slight evaporation takes place, but the vapors are entirely non-toxic. The liquid does not actually begin to boil until the relatively high temperature of 420° C. is reached.

Safety Glass

Substitutes of the celluloid intermediate layer of the usual three-ply type of safety glass are being tried by materials which present some points of superiority over celluloid itself regarding fastness to light and weathering qualities. While cellulose acetate offers an advantage in superior resistance to ultra-violet rays, a hitherto insuperable difficulty has appeared in the defective adhesion of a cellulose acetate film to the two outer glass sheets. Greater success has attended the application of synthetic resins obtained by polymerization of certain organic compounds (as distinct from condensation products of the Bakelite of pollopas type). According to foreign reports the safety glass developed in Germany under the name of Luglas contains an intermediate layer of this type. Polymerizable substances which find application in this connection include ethyl crotonate and ethyl acrylate.

Pure Vegetable Colloid

A pure vegetable colloid and gelatine, produced entirely from Carragheen (*Chondrus crispus*) has been introduced under the name of Gelozone. It has high gelatinizing properties, is simple to use, and unlike gelatine, it can be used at high temperatures without unpleasant odor; in fact, to obtain its full power it is necessary to boil it, unless the commodity in which it is to be incorporated is subsequently boiled. It was originally manufactured as a culinary article for use in the making of blanc-manges, creams, sauces, etc., and for thickening soups. By analysis it is found to consist of carbohydrates 64.78 per cent.; fat (soluble in light petroleum) 0.38; protein 6.69; mineral matter 18.40; fibre 1.80, and moisture 7.95.

Antiseptic and Germicide

A new and very powerful antiseptic and germicide recently put on the market in London, under the trade name "Abracide," is a liquid with odor and taste slightly reminiscent of thymol. It has been found to have a phenol coefficient of 105, using staphylococcus aureus as the test organism and at 37° C. A 5 per cent. solution of Abracide in a 10 per cent. soap solution is antiseptic and germicidal in dilutions of one part in 300, the solution being found effective against the most highly resistant spore-bearing bacilli.

Its stability in soap solutions is a marked advantage over most other germicides. This stability is due to its very weak acid character—insufficient to hydrolyze the soap. The material is not easily soluble in water, and is generally used as a 5 per cent. soap solution; or it may be dissolved in industrial ethyl alcohol or in isopropyl alcohol. Experience has indicated that for general use a concentration of 0.1 per cent. is ample as a germicide, and that a smaller quantity, say, 0.05 per cent., would probably suffice as an antiseptic. Trials have already shown the value of the new material in preventing the bacterial decomposition of tan liquors in the leather industry; in the production of antiseptic soaps; in preventing the objectionable odor and mold formation which frequently occur on cardboard boxes; and in the preparation of water-miscible disinfectants.

Chemical Facts and Figures

The "New Deal" In Industry

Industrial leaders have turned aside from the pressing problems incident to business conditions to analyze the Industrial Control Bill. Out of all legislation passed at the present session designed to end depression, no one bill will have more profound or lasting effect on business and the methods of conducting it than this act. Enthusiastically applauded by business leaders when suggested abstractedly by the President at the U. S. Chamber of Commerce Dinner, the idea now reduced to specific terms in a bill fostered by Senator Wagner (N. Y.) and said to be largely drafted by the labor union lawyer, David L. Podell, contains several angles which are being strenuously opposed.

Chief objection lies in the dictatorship which is the backbone of the bill. The *Financial Chronicle* in commenting on the bill states: "There are debatable methods and machinery set up to accomplish desired ends, the whole proposition being based upon the declaration that a national emergency exists."

Licensing Power Feared

The club to be used as an enforcement agency to drive manufacturers into organized groups is the licensing power by which, through the withholding of a license to conduct business, a recalcitrant manufacturer may be driven into such a group in his particular line of business under penalty of being deprived of the right to continue his business upon an inter-state scope. The bill as passed by the House places arbitrary powers in the hands of an industry dictator without leaving any method of appeal from any decision that might be made.

Another serious objection from the manufacturer's viewpoint is that the bill provides for collective bargaining on the part of labor on matters of wages and hours while producers are not accorded similar rights. Quite obviously, objectors to this provision point out that matters of wage and hours of work are largely governed by local conditions and by conditions peculiar to each individual industry. It is felt in certain quarters that the bill has been written largely for labor and with a minimum concern for the manufacturer and his problems.

Quite frankly the bill is designed to raise the wage scale and to increase employment. Opponents of the measure point out, however, that if the major objectives are achieved a higher wage scale is more than likely to result in a flood of cheap foreign goods which can be sold in this country at extremely low prices. The final result will not be greater employment but rather even greater unemployment than exists at the present time.

The bill while before the House received scant attention from industry. Perhaps it was realized that it would be futile to waste time and effort before the body. However, as soon as the bill reached the Finance Committee of the Senate, concerted attacks were centered on the dictatorship and licensing provisions. After a week's hearing the Senate Finance Committee made several important amendments and the fate of the bill as we go to press rests with the Senate.*

Doubts Legality

Senator Reed (Pa.) has predicted that the bill will not be upheld by the courts and the final test of legality will come in the Supreme Court. It has been pointed out that the broad powers of the industry dictator are likely to stifle progress. Opponents point to the automobile industry as an example, and say that if such a program had been practised in the horse and carriage days that it would have been possible to have stopped one of America's leading industries. While this example may be somewhat far-fetched, it indicates a fear that new products, new inventions, and new processes which would, by their very nature upset existing conditions at least temporarily, might be hard to get past a conservative dictator. This particular phase of the controversy has special significance for such industries as the chemical and allied groups such as lacquers, pharmaceuticals, dyes, plastics, or any field where a number of new developments are likely to occur almost over-night.

Features of Industry Bill

Industrial control bill in form said to be highly satisfactory to the President, was finally reported by the Senate Finance Committee. Licensing feature was restored, although in a limited form; sales tax was rejected, and a new taxation scheme substituted. Highlights of the bill as reported:

Licensing feature is to be operative only for one year and utilized only where there are unreasonable reductions in wages or prices.

Broad latitude given labor in organizing workers in the industries, uninfluenced by their employers.

Affords industry added protection against unfair competition from abroad by authority vested in President to place an embargo on imports if necessary in carrying out of purposes of the legislation.

Paves way for putting oil pipe lines under control of I. C. C.

Permits control of oil surpluses.

Tightens up existing revenue law in respect of deductions for stock and bond losses.

Imposes a 5% tax upon dividends, payable at source.

Assesses a one-tenth of 1% tax on the value of all corporations.

Increases 1c presetn Federal tax on gasoline to 1½c per gal.

Increases to 1% and extends for two years privilege of filing consolidated returns of corporations.

Rejects so-called "Buy American" provision of the House bill.

M. C. A. Discuss Bill

The annual meeting of the Manufacturing Chemists' Association held at Shawnee-On-Delaware, Pa., on June 1-3 was largely taken up with a discussion of the Industrial Control Bill. While sympathy was expressed by the leading chemical industrialists for the main purposes of the bill, serious objections were noted, and this opinion was formally expressed in the following resolution: Whereas, the Manufacturing Chemists' Association finds many objections to the national industrial recovery bill in its present form as effecting the chemical industry; now, therefore, be it

Resolved: That its consideration be referred to the executive committee with power, for suggestion of such amendments as may seem wise and for such further action from time to time as the committee may deem necessary, including cooperation with the Synthetic Organic Chemical Manufacturers' Association.

Speakers at Shawnee

Speakers at the meeting included Elon H. Hooker, president of Hooker Electrochemical, who spoke on "Industry Today and Tomorrow;" Harry M. Mabey, Mathieson Alkali traffic manager, who spoke on "A Changing Transportation Machine and Its Relation to the Chemical Industry;" Charles Belknap, president of Merrimac and chairman of the M. C. A. Executive Committee, who reported on the program of the current year; Ernest T. Trigg, who discussed important trends in the insecticide field; and James A. Emery, general counsel for the National Association of Manufacturers, who gave a comprehensive analysis of the Industry Control Bill. The speeches of Mr. Belknap, Mr. Mabey and Mr. Hooker are reported in full in this issue, beginning page 513.

The following were unanimously chosen as officers for the ensuing year:

President, William B. Bell, president of American Cyanamid; first vice-president, E. M. Allen, president of Mathieson Alkali; second vice-president, George W. Merck, president of Merck & Co.; Treasurer (re-elected), J. W. McLaughlin, vice-

*Passage by the Senate is expected June 9. Conferees will have to eliminate radical differences between strictly administration measure as passed by the House and the much-altered bill reported by the Senate Finance Committee.

president of the Carbide & Carbon; secretary, Warren N. Watson.

Members of executive committee (re-elected), Charles Belknap, of Merrimac, chairman; Charles W. Millard, of General Chemical; H. L. Derby, of Cyanamid & Chemical; Leonard T. Beale, of Penn. Salt; J. H. Dunbar, of Grasselli; Ernest T. Trigg, of John Lucas & Co.; and (succeeding George W. Merck who was elected a vice-president), Clyde D. Marlatt of Martin Dennis.

Association News

A. I. C. Honors Sherman

A. I. C. at its annual meeting May 20 at the Chemists' Club (N. Y. City) three new members of the board of councillors were elected, the new members being:—Frank G. Breyer, Singmaster & Bryer; Dr. Herbert R. Moody, City College; and Miss Florence E. Wall, technical writer and publicity worker; Executive officers of the association, being elected for two years, remain the same and are as follows: President, Dr. Henry G. Knight, Bureau of Chemistry and Soils, Dept. of Agriculture; vice-president, Dr. M. L. Crossley, of Calco; treasurer, Dr. D. P. Morgan, Scudder, Stevens & Clark; and secretary, Howard S. Neiman.

Dr. Henry C. Sherman, Columbia chemistry head, was the recipient of the 1933 medal for outstanding service in the field of chemistry.

Golf—When and Where

Chemists' Club (N. Y.) golf tournament has been definitely scheduled for June 27 over the Westchester Hills Golf Club, White Plains, N. Y. Arrangements are in charge of Robert "Bob" J. Quinn of Mathieson Alkali. This is always one of the best attended affairs of the summer season and those who wish to attend are urged to make reservations as early as possible.

Salesmen's Association of the American Chemical Industry will hold its first golf tournament of the season as well as its "Annual Party" at Hempstead Country Club, Hempstead, L. I., June 15.

Entertainment committee is planning a program which will make the day one long to be remembered by those who attend. The four customary tournaments have been arranged by the committee and dates will be announced later.

Entry fees will be lowered, with no sacrifice in the quality of entertainment. A new feature to be included in the program will be a "putting contest."

Chicago Drug & Chemical Association golf dates: June 13 at Medinah Country Club; July 18 at Bob O'Link Golf Club; Aug. 15 at Westmoreland Country Club; Sept. 13 at Olympia Fields. Elmer F. Smith is golf committee chairman.Chicago Perfumery, Soap & Extract Association is participating. First luncheon meeting of the 1933-1934 season was held May 25 at Chicago Athletic Association with Explorer Harold D. Eide as guest speaker.

Rubber Section Officers

J. Kirschner, Dryden Rubber chief chemist, is new head of the Chicago A.C.S. Rubber Group. N. Y. City Rubber Group met May 5. Papers and speakers: "The Effect of Oils and Various Chemicals on Duprene Compounds," by Ernest Bridgwater, du Pont; "Commercial Uses of Rubber, Thiokol and Duprene with Oil and Solvents," by W. L. White, Raybestos-Manhattan, Inc.; "Antics of Electrons," by O. H. Caldwell, Editor of *Electronics*.

Harris, New Oil Society Head

J. P. Harris, Chicago, manager for Industrial Chemical Sales, was elected president of the American Oil Chemists' Society on May 2, succeeding N. C. Hammer of Dallas, Tex.

Other officers elected included L. Hutchins, Savannah, Ga., first vice-president; F. R. Robertson, Houston, Tex., second vice-president; J. L. Mayfield, Pinebluff, Ark., third vice-president, and J. C. P. Helm, New Orleans, secretary-treasurer.

Local Chapter Meetings

William J. Cotton, National Aniline, is new chairman of Niagara chapter, A. I. C. Dr. Howard Post was re-elected secretary and treasurer. Robert L. Perkins, Buffalo, was made vice-chairman, and Arthur W. Burwell, Niagara Falls, chapter representative to the national council.

Mr. Perkins gave a talk on the subject of research in chemical plants. Maurice Taylor, Mathieson, spoke on selection of personnel for research, Dr. Post on training of such workers, and Arthur J. Norton, of General Plastics, on selling research programs to boards of directors.

N. Y. and north Jersey sections of the A. C. S. ended their meetings for the season with a "get-together" dinner, June 2, in the Roger Smith-Broadmoor Restaurant, 40 E. 41st, N. Y. City.

Prof. Marston T. Bogert, Columbia; Prof. Allen Rogers, Pratt; Dr. Allen F. Odell, director of research; duPont Viscoloid and Dr. Frederick G. Zinsser, president, Zinsser & Co., Hastings-on-Hudson, gave informal addresses.

At recent annual meeting of Southern Pine Association, R. M. Morriss, American Lumber and Treating Corp., Chicago, presented paper "Chemically Treated Wood and How It can Be Profitably Adopted by the Lumber Manufacturers."

Drug, Chemical and Allied Trades Section, N. Y. Board of Trade, has gone on record as favoring revision of the Black Bill. Resolution was presented by Merck's John A. Garvin.

COMING EVENTS

American Institute of Chemical Engineers, Chicago, June 14-16.

Eleventh Colloid Symposiums, Madison, Wis., June 15-17.

National Fertilizer Association convention, White Sulphur Springs, Greenbrier, June 19-21.

American Society for Testing Materials, Chicago, Hotel Stevens, June 26-30.

American Electroplaters' Society, Chicago, Congress Hotel, June 27-30.

American Association of Textile Chemists and Colorists, Annual Meeting, Chicago, September.

American Chemical Society, Chicago, Week of Sept. 11.

National Petroleum Association, Annual Meeting, Hotel Traymore, Atlantic City, Sept. 20-22.

American Association Natural Gas Dept., Chicago, Sept. 25.

National Metal Congress and Exposition, October 2-6.

Twenty-second Annual Safety Congress, Hotel Stevens, Chicago, Oct. 2-6.

Federation of Paint & Varnish Prod. Clubs, Edgewater Beach Hotel, Chicago, Oct. 26.

National Paint, Oil & Varnish Association, Edgewater Beach Hotel, Chicago, Oct. 27-30.

Exposition of Chemical Industries, Grand Central Palace, N. Y City, Dec. 4-9.

American Society of Mechanical Engineers, N. Y. City, Dec. 4-9.

Fifth National Organic Chemistry Symposium, Cornell, Dec. 28-30.

Foreign

Comparison of Exports

The rate of decline in exports of chemicals and allied products from Germany, as compared with the U. S., in the first quarter of 1933 was less than in 1932. German exports of chemicals and allied products, valued at $39,000,000, were considerably above those of the U. S., which amounted to only $21,700,000. German imports of chemical products, however, were a little more than half those of U. S., or $9,000,000. Many commodities showed improved trade, offset by declines in other items. In the improved trade, most significant was the 4% increase in quantities of pigments, paints, and varnishes exported by Germany during quarter, to a total of 22,300 tons, valued at $3,000,000, while exports of the same group from U. S. fell 20%, to $2,260,000. Shipments of dyes from Germany fell about 10% in quantity while gains were made in exports of several industrial chemicals. A number of commodities recorded increases, especially those in which U. S. supplied bulk of the goods imported into Germany—such as coal tar, carbon black, rosin, turpentine, and borax.

British Chemical Wages

Wage agreement in Britain between the Drug and Fine Chemical Manufacturers' Association and the Chemical Workers'

Union, which has been in effect since 1925, expired on March 31, 1933. This pact provided minimum wage rates of 50, 55 and 60 shillings for men workers and 34 and 28 shillings for women.

Although employers have declined to negotiate a new agreement, a suggestion embodying minimum wages of 80s for men and 40s for women, a 40-hour week and the employment of only one minor to every four adults has been drafted by union authorities.

German Exposition

Prospectus of the German Chemical Plant Exhibition ACHEMA VII has just been issued. This Exhibition will be held in Cologne during the week of May 18, 1934. Annual General Meeting of the German Chemical Society and other scientific and technical societies will be held in Cologne at the same time. The preparations which have been made from the point of view of technical organization in the interests of all those taking part in this Exhibition are very fully set forth in the Prospectus.

Those interested may obtain a copy of the Prospectus which is copiously illustrated, free of charge on application to the "Dechema" Deutsche Gesellschaft fur chemisches Apparatewesen E. V., Achema-Geschaftsstelle, Seelze bei Hannover.

Nitrate Reorganization

Special cable to N. Y. Times from Santiago, Chile, May 21:

"The plan recently brought forward by Gustavo Ross, Chilean Minister of Finance, for the reorganization of the nitrate industry and involving Cosach, the Nitrate Corporation of Chile, promises to be a satisfactory basis for the solution of the problem, according to declarations made here yesterday (May 20.)

Importance is attached to the visit to N. Y. City of Horace Graham, representing the Cosach B shares in the liquidating committee. New York and London meetings will reveal how the Ross plan appeals to foreign interests in the Chilean nitrate industry. Representatives of some groups of foreign bondholders, now here to watch developments, are inclined to believe the plan will lead to a general readjustment of interests, foreign and domestic."

An outstanding feature of the Ross plan is a proposal for the formation of a large sales corporation to function all over the world. The new conditions under consideration for Cosach can be summarized as follows:

Complete separation of the Chilean State, the Compania de Salitres de Chile (Cosach), the Lautario Nitrate Co. and the Anglo-Chilean Nitrate Corp., which would proceed to liquidate their mutual obligations. The latter two companies would recognize their own private obligations and change their shares into ordinary Cosach shares.

Definite suppression of the 60-peso export tax.

Delivery to the Chilean State as a contribution for the present year of 140,000,000 pesos (about $8,484,001), which would cover the government's participation in the proposed sales corporation.

The government would demand, beginning June 30, a contribution of 25% of the profits of the sales corporation

The sales corporation would take charge of the whole business of nitrates, iodine and by-products of the nitrate industry. The whole production would be delivered to the new corporation.

The sales corporation would be authorized to issue bonds up to $51,000,000. Of these, $48,000,000 worth would be offered in exchange for the nominal value of prior bonds. The balance of $3,000,000 would be used to cancel the loan made by the Anglo-Chilean Nitrate Corp. in the industry in Dec. 1931.

New Glue Uses?

International Association of Bone Glue Manufacturers, commonly called "EPIDOS" which groups nearly all European manufacturers of this commodity, has organized an international competition providing for 20,000.—Swiss francs.

Awards will be made for chemists, technicians or inventors, authors of memoranda indicating results of research for the pupose of using bone glue in the manufacture of new products and products in the composition of which, hitherto, bone glue has not entered. Or the improvements in processes already using bone glue which will permit development of its use.

Competition will close on Feb. 28, 1934; is open to all those who may desire to take part. Competition is held under rules and organized by Secretariat of Epidos Glue Competition, 58, rue de Chateaudun, Paris.

The 1932 accounts of the well-known German chemical firm, Goldschmidt A.G., of Essen, show that there was no profit on year's trading. To cover sums written off recourse was had to the reserve. There were special allocations amounting to Rm. 397,000. In preceding year capital was reduced by cancellation of shares to value of Rm. 1,870,000, leaving capital at Rm. 16,500,000 (about £825,000 at par).

Word reaches this country of the death on April 1, 1933, of Horace Walter Dover, J. P., Chairman and Managing Director of Messrs. Dover Ltd., Northampton, (England). Mr. Dover was the founder of Dover Ltd., manufacturers of automobile and cycle accessories and plastic materials. He was 73 years of age.

"Montecatini" on April 18 paid a dividend of 42½c. per share on American depositary receipts for capital stock to holders of record April 11. A year ago a distribution of 60c. per share was made for the year 1931.

Negotiations for merger of Canada's three main distillery companies, Hiram Walker-Gooderham & Worts, Canadian Industrial Alcohol & Distillers Corp. Seagrams, are nearing conclusion, according to reports.

The first annual general meeting of the Plastics Group of the Society of Chemical Industry was held, April 26, at the Science Museum, South Kensington (England) where the Plastics Exhibition is being held.

Washington

Shoals Bill Signed

President Roosevelt on May 18 signed the Norris-Hill bill providing for Government operation of the Muscle Shoals property and embracing plans for development of the entire Tennessee Valley.

By his signature the President brought to a close the 13-year-old controversy over the disposition of the huge wartime Alabama power and nitrate plant.

New act authorizes President to appoint a board of three as a "Tennessee Valley Authority" to manage industrial and agricultural development of the valley, with offices near Muscle Shoals, Ala. It can acquire real estate and build dams, power houses, reservoirs, transmission lines and navigation projects; unite power installations into one or more transmission line systems; contract with commercial producers for fertilizer; manufacture experimental fertilizer, manufacture and sell explosives to the Government at cost; produce, sell and distribute power, lease nitrate plant No. 2 for the private manufacture of fertilizer; sell $50,000,000 in 3½% 50-year bonds to finance the improvements, and with Presidential approval, complete dam No. 2 and the steam plant at nitrate plant No. 2, near Muscle Shoals.

The conferees appointed by the Senate to iron out the differences in the Hill and Norris Measures were: Senators Smith (S. C.), chairman of the Senate Committee on Agriculture; Kendrick (Wyo.); Wheeler (Mont.); Norris (Neb.); and McNary (Ore.). Conferees appointed by the House were Representatives McSwain (S. C.), chairman of the House Committee on Military Affairs; Hill (Ala.), and James (Mich.). Subsequently the President held a further conference with Senator Norris and Chairman McSwain, giving them his views in regard to the power and fertilizer provisions of the two bills. The conferees reached an agreement and reported back to their respective houses on May 15.

The final form of the bill agreed upon includes in large measure the provisions of the Norris Bill with respect to the building of transmission lines by the Government and to experimental production of

fertilizer. Authority is given for the sale of fertilizer that may be manufactured, but assurance has been given, it is reported, that this authority will not be exercised at least during the present administration. The Conference Report was agreed to by the Senate on May 16, and by the House on May 17.

Alcohol Fuel Tests*

Senator Bennett Champ Clark of Missouri, an advocate of the alcohol gasoline blending program, has introduced a resolution to create a joint committee of the House and Senate to hold hearings and make a study, during the recess of Congress, of all aspects of the blending proposal, with the view of recommending legislation on the subject next Winter.

Albumen Tariff Ruling

An appeal by Attorney-General Cummings to the higher court to prove that "powdered albumen" to all commercial intents and purposes is the same as "dried egg albumen" has been asked by the American Farm Bureau Federation.

Under flexible provisions of the Tariff Act, Tariff Commission recently increased rate on "dried egg albumen" to 27c a pound, the full 50% maximum permitted under the law, but upon appeal by importers, the lower court decided that the commission's ruling did not apply to "powdered albumen" and ordered that it be allowed entry at the lower rate prescribed in the act.

General Chemical has asked I. C. C. to order Norfolk & Western to refund excess of rates of more than $1.80 per ton on coal shipped to its Pulaski, Va., plant from the Pocahontas district of West Virginia prior to March 18, 1933. On March 18 the commission set $1.80 as the maximum reasonable rate from the Pocahontas fields to Pulaski.

Personal

A. E. Marshall, A. I. Ch. E. vice-president, spoke May 8 before the Purdue Student Chapter of the Association on "Chemical Engineering as a Profession" and the following day addressed the senior students of all the engineering schools of Purdue on "Relation of Chemical Engineering to Other Branches of Engineering."

Ernest T. Trigg, of John Lucas Co., has been appointed chairman of an Industrial Relations Committee of the Philadelphia Chamber of Commerce.

Dr. D. P. Morgan, Jr., of Scudder, Stevens & Clark, has moved offices to 1 Wall st., N. Y. City. Dr. Morgan is the N. Y. Section A. C. S. secretary.

Dr. C. L. Butler is Senior Fellow in Pure Research Dept. of Research in Pure Chemistry, Mellon.

*Open test of gasoline-alcohol blends held June 9 at Washington by group of interested associations, companies, Bureau of Standards.

Personnel

Davis Leaves R & H

Charles K. Davis who was elected president of R. & H. shortly after its acquisition by duPont, has been elected president of Remington Arms (latest du Pont acquisition), succeeding Saunders Norvell, who resigned, but remains as a director of the company.

Dr. E. A. Rykenboer now directs R & H Chemicals Dept. of duPont

Mr. Davis will act as general manager of Remington as well as president. He has held important positions with du Pont subsidiaries, E. E. Handy has been elected vice-president in charge of sales. George Bingham remains as secretary.

Dr. E. A. Rykenboer has been appointed general manager of the R. & H. Chemicals department of the du Pont company, to succeed Mr. Davis, and Milton Kutz has been appointed assistant general manager of R. & H. to succeed Dr. Rykenboer.

Werk Officers Elected

Howard Dock has been elected president of M. Werk Co., Cincinnati, O., soap, stearic acid, etc. manufacturers. In addition to Mr. Werk, directors elected include Joseph Sagmeister, William W. Oskamp, Albert G. Schwartz and Louis Werk. Mr. Schwartz was elected vice-president and Louis Werk was re-elected secretary-treasurer.

Fred E. Wolf has been appointed sales manager of the Pittsburg district by W. W. Sly Manufacturing Co. Mr. Wolf is a specialist on dust collection and blast cleaning equipment.

Dr. E. H. Killheffer, manager Fine Chemicals Division du Pont, has transferred headquarters from N. Y. City to Wilmington.

M. V. Dreyspool, for past ten years manager of sales for Erie Steel Barrel, has discontinued that connection. He will maintain offices to continue his other lines.

Francis J. Oakes, Jr., has been elected a director of United Dyewood, succeeding Robert Scott.

Lightning Destroys

Struck by lightning during an electrical storm, plant of the Bronze Powder Corp. at Painesville, Ohio, was virtually destroyed by fire early on the morning of June 1, with a loss of more than $30,000. Company, which manufactures bronze powder used in production of aluminum paint, will rebuild at once.

Obituaries

Ernest Hopkinson

Ernest Hopkinson, 60, chairman and a director of Naugatuck Chemical, and vice-president of U. S. Rubber, who held several hundred patents in the rubber and related chemical industries and who was the originator of the flat band method of making automobile tires, died May 3 at his home in N. Y. City after an illness of six months.

Mr. Hopkinson was born in Chester, England, coming to this country as a young man. He studied law here and entered practice in this city in 1895. He subsequently became counsel for several rubber companies. Among the patents held by Mr. Hopkinson was one for the manufacture of lastex, a trade name for a rubber-cored thread which is being widely used in the textile field. Another process developed by him was the spraying of rubber, a method of treating latex as it comes from the tree and preparing it for shipment.

Thomas J. Keegan, 67, chemist and technical journalist (former associate editor of *Paper Industry*) died May 1 at South Orange, N. J.

E. F. Daniel, Jr., 55, Baltimore district manager for the A.A.C., died suddenly May 16. His first connection was with V.-C., but in 1914 we went to A.A.C. as vice-president. After an illness of several years he relinquished the vice-presidency, but remained in charge of Baltimore operations.

Arthur Orr

Arthur Orr, 48, former Commercial Solvents vice-president, also a former first secretary of the American Embassies in Paris and London died June 6 in St. Louis after a serious operation. After graduating from Princeton in 1906 he entered the diplomatic service, first in South America and later, in important European capitals. He served in the World War, and at its termination joined Commercial Solvents. He retired early in 1932 because of poor health.

Prof. William P. Ryan, 38, brilliant head of the chemical engineering department of M. I. T., died May 31.

Louis Symonds Wolf, 71, president of the Fairfield Chemical Co., before its absorption by General Chemical, died May 30. He was a director of the latter until 1913.

Frank L. Belknap, 51, patent lawyer, died in N. Y. City last month. He was chief patent counsel for J. Ogden Armour in 18-year litigation leading to sale of Universal Oil (Dubb's patents) to Shell Union and Std. of California in 1931 for $25,000,000, recouping in part the former huge fortune for Armour's widow.

April Employment

Factory employment in manufacture of chemicals and related products increased more than 3.5% in April. Payroll totals showed a slight gain, following a 2% decline in March. April employment in chemical industries was but 1.9% below that in April, 1932; payroll totals were about 14.1% lower.

Details for the several divisions comprised in the calculation of the bureau's index numbers for the chemical industries show the following comparisons for April:

Employment

	Apr., 1933	*Mar., 1933*	*Apr., 1932*
Chemicals	85.2	86.4	87.7
Cottonseed, oil, cake, and meal	27.8	38.4	41.1
Explosives	75.1	75.7	75.4
Fertilizers	117.4	67.4	90.0
Paints and varnishes	65.3	63.3	72.8
Petroleum refining	62.9	62.8	65.1
Rayon and related products	133.1	142.0	138.8
Soap	94.0	93.7	96.5

Payroll Totals

	Apr., 1933	*Mar., 1933*	*Apr., 1932*
Chemicals	59.4	60.2	68.0
Cottonseed, oil, cake, and meal	23.3	33.0	40.4
Explosives	44.9	47.7	51.5
Fertilizers	59.4	36.3	58.2
Paints and varnishes	48.7	43.5	62.8
Petroleum refining	52.6	53.2	58.7
Rayon and related products	103.1	114.5	125.6
Soap	76.8	76.3	90.5

Employment in factories in N. Y. State, manufacturing chemicals and related products, declined 1% in April, in comparison with the preceding month. Employment was fairly steady in N. Y. City, with a decline of but 0.1%. General factory employment increased 2.7% in the state, and payroll totals increased 4.4%. In comparison with April, 1932, general factory employment was 11.3% lower, and payroll totals were 20% less. Changes in employment in the various divisions were:

	April compared with March (percentages)	
	State	*City*
Drugs and industrial chemicals	—2.6	+0.8
Oil products	—2.3	—1.0
Paints and colors	+1.6	+1.6
Photographic and miscellaneous chemicals	+0.4	—2.7

Harsh & Chapline Shoe, Milwaukee, has discontinued its tanning operations.

Company News

Commemorating 20 Years

Hercules Powder has issued a beautifully illustrated booklet of 40 pages commemorating the 20th anniversary of Hercules Powder in business. The title of the booklet is "The Growth of a Modern Hercules." The brochure is highly instructive and contains a wealth of information not only on the interesting history of the company, but on its various products. Copies are available by writing to The Hercules News Bureau, Hercules Powder Co., Wilmington, Del.

Golwynne Magnesite & Magnesia Corp., Chrysler Bldg., N. Y. City, has been appointed sales agents for U. S. for F. X. Pereira & Sons, which owns and now has in active production a new deposit of ilmenite, zircon, and monozite in Travancore State, in South India.

J. P. Devine Mfg. Co., Inc., Mt. Vernon, Ill., has moved Chicago office from 105 W. Madison st. to Room 1114, 307 N. Michigan ave., and N. Y. City office from W. 43rd st. to Room 603, 205-17 E. 42 st.

Paper Makers Chemical, Milwaukee, Wis., is offering new package for soft soaps to jobbing trade through its Industrial Chemicals Dept. New container is self-dispensing drum filled with perfumed, opalescent, vegetable oil soap manufactured by the company.

D. H. Sencindiver, trustee, Winchester, Va., offered for sale at public auction on May 19, at Gore in Frederick County, Va., plant of Eastern Silica & Chemical Corp., including quarry which is said to contain a practically inexhaustible supply of high grade glass sand.

P. & G. has acquired business of Hewitt Bros. Soap Co., Dayton, Ohio. Company manufactures "Easy Task" soap flakes and certain privately branded soaps. Hewitt business is to be continued under its present management.

Farm Products Chemical of America has been incorporated in Dover, Del., with a capital of 10,000 shares no par value common stock.

Edgar M. Queeny, Monsanto president, states that operations of the nitro plant of Rubber Service Laboratories, subsidiary, are at the highest capacity since 1928 and that orders for some of the newer products require installations for increased capacity.

Essolube (Std. of N. J. hydrogenated lubricating oil) has been placed on United Kingdom market.

Goodrich's Akron factory is on 24 hour basis.

Natural Oil Products instituted five day week June 1 without any reduction in pay of salaried employees.

Pfaudler's advertising manager, H. R. Hanson, is author of article "House Organs" in May *Class & Industrial Marketing*. Pfaudler Co. reports large orders for brewing equipment.

J. T. Baker Chemical's Eastern Analytical Research Fellowship for 1933-34 has been awarded to G. W. Low, Jr., graduate of Princeton, 1931. Mr. Low will engage in analytical investigations at Princeton.

Catalin Corp. of America has purchased American rights under the Pollopas patents covering cast phenol-formaldehyde condensation products.

On May 10, suit was started under Patents Nos. 1,854,600 and 1,858,168 in U. S. District Court in Brooklyn against Marblette Corp. of Long Island City. It is alleged that these patents are infringed by the sale of opaque, translucent, transparent and clear materials as made by the latter corporation.

Thomas J. Shields Co., importers, manufacturers, dealers and agents in foreign and domestic raw materials, who for the past six years have been located in the International Mercantile Bldg., 7 to 11 Water st., N. Y. City, have moved their offices to larger quarters in same building. Telephone number, BOwling Green 9-3535, remains the same.

Linde Air Products is now marketing new all-purpose aluminum welding flux, Oxwelded Aluminum Flux. New flux is intended to replace two fluxes previously marketed, one for welding pure aluminum and the other for welding aluminum alloys.

Wilson & Bennett Manufacturing Co., steel container specialists, Chicago, has issued four-page folder describing Benetco swivel spout por-pail. New product has added advantages of the exclusive swivel spout and substitution-proof combination nozzle and vent.

Celanese Corp. denies rumors of changed ownership.

Chemical Fads and Fancies

One chemical company reports as much business in tonnage in the first week of May, a five day week, as it did in any full month of 1932———Another sign of returning normalcy———John D. Beatty, of Carnegie Institute reports that metallurgists and chemists are once more in demand in the Pittsburgh steel area.——— Did you know that St. Patrick is not exclusive property of the Irish after all?— that he is the patron saint of all engineers!———Trials are now being made on a commercial scale to preserve eggs in autoclaves under pressure using a mixture of CO_2 and nitrogen gases.———Russell Brown, American Commercial Alcohol chairman, was in Washington recently for a meeting with the director of the Bureau of Industrial Alcohol———Dr. H. E. Fritz, manager of the chemical sales division of Goodrich, was the author of an article on "The Importance of Factory Cooperation in Selling" in April *Rubber Age*.———The Hercules Bridge Club participated in the World Bridge Olympic staged by the National Bridge Association. ———According to Dr. Arthur D. Little's Industrial Bulletin there are nine different kinds of water. Well, who cares, since 3.2 came back?———Viscount Leverhulme, who has served as president of the London Chamber of Commerce for two years, has been reelected.———Dr. J. V. N. Dorr sailed for Europe on the Europa, May 13 and will not be able to preside at the Chemical Engineers' meeting at Chicago.———Prof. Fritz Haber, Nobel Prize winner, famous the world over for his synthesis of ammonia, has "resigned" his position as head of the Dept. of Physical Chemistry at the Kaiser Wilhelm Institute in Berlin.———President Marks of the Chemists' Club (N. Y.) has appointed A. Cressy Morrison (Carbide) chairman of a committee of five to make a thorough study of the unemployment situation among chemists and engineers.——— J. Davison Pratt, general manager of the Association of British Chemical Manufacturers, arrived in this country on May 26 on his way to Canada.———Wood Crady, vice-president of Federal Chemical, has been in and out of N. Y. City twice in the past month.———Miss Georgia Hencken, granddaughter of Mr. and Mrs. William S. Gray, Sr., was married to George H. Perkins on June 3.———Walter L. Savell, Mathieson chlorine expert, was added to the program of the Insecticide & Disinfectant Mfrs. Association meeting at Chicago. ———Frederick W. White, president of Mutual Chemical for 25 years, has set at rest rumors that he will resign. He plans no retirement and reports shipments better than at anytime in the past three years.———Leonard T. Beale, president of Penn Salt, has been elected director of National Lead.———W. H. Aldridge, president of Texas Gulf Sulphur, was mentioned at the Senatorial investigation of J. P. Morgan & Co., as a subscriber to Standard Brands stock.———Chemical companies that maintained an average daily balance of $1,000,000 or over with the house of Morgan during any year of the period from Jan. 1, 1927 to Dec. 31, 1931 included du Pont, and Texas Gulf Sulphur; those that might be said to be closely allied, included Celanese, N. J. Standard Oil, Royal Baking Powder. Surprising the few chemical directorships held by Morgan partners as brought out in the testimony. Horatio G. Lloyd is on General Asphalt; George Whitney is on Texas Gulf's board; and so is T. S. Lamont.———National Oil Products' president, C. P. Gulick, is author of "Scientific Product Research-Tonic For Sales" in the May "Executives Service Bulletin"———Large-scale production of wood sugar is being considered in Sweden by a process developed by Bergius and Hagglund.———Over 700 were at the recent Cyanamid dance at the McAlpin. Each "sub-sid" had its own group of tables.———Says the "Chemical Trade Journal" (London) "Asahi Glass Co. intends exporting its bicarbonate of soda to the U. S. A., and is extending its plant for this purpose." Thanks for the tip!——— It is going to be hard to find a man to fill the place left vacant by the untimely death of George V. Horgan of the paint associations.———The Watchung Molecules will meet this month at the summer home of Mr. and Mrs. August Merz, Denville, N. J.———There are 6,300 tons less of Chilean nitrate in this country as a result of a fire in the warehouse of Charleston's fertilizer broker, Frederick Richards.———Tablets of a British plastic "Bexoid" were used for note paper by the occupants of the plane that recently conquered Mount Everest when the noise became so deafening that ear-phones were useless.———"Doc" Wilson, former divisional sales manager of Cyanamid in charge of "Cyanogas" and liquid HCN sales, had his picture in the *N. Y. Times* recently, holding a piece of wood mostly eaten away by Termites.———H. V. B. Smith of H. J. Baker is back after a European trip.———A. A. Wasserscheid, Mallinckrodt N. Y. manager, has been added to the executive committee of the chemical section of the N. Y. Board of Trade.——— Pierre S. du Pont, the III, son of Lammot du Pont, is to be married June 23. His daughter was married on June 3.

Heaviest volume of April business handled in past five years is reported to the Corn Industries Research Foundation by the 11 corn refining firms constituting its membership.

Business booked covers starches, dextrines, sugars, syrup and other products of corn which enter into food consumption or are used in manufacturing operations by other industries. Total corn grind of the industry for April was 7,116,602 bushels, an increase of more than 50% over April, last year.

Firms reporting are: American Maize-Products Co., Anheuser-Busch, Clinton Corn Syrup Refining, Corn Products Refining, J. C. Hubinger Brothers, Huron Milling, Keever Starch, Penick & Ford, Piel Brothers Starch, A. E. Staley Manufacturing, and Union Starch & Refining.

CO_2 News of the Month

Michigan Alkali one of the largest of firms in U. S. now manufacturing solid CO_2, report a 100% increase in sales of dry ice, in first four months of 1933. Company opened its plant in April, 1931, and in 1932 produced a total of 200,000,000 lbs.

Use of solid CO_2 in U. S. has jumped from 40,000,000 lbs. in 1929 to 122,000,000 lbs. in 1932, and an estimated production of 140,000,000 lbs. in 1933.

Pure Carbonic, owned 60% by Air Reduction and 20% by U. S. I., has arranged to take over CO_2 and dry ice business of De Lancey Chemical, a subsidiary of Publiker Commercial Alcohol, Philadelphia, and also dry ice supplies of Penn. Sugar. This will materially enlarge dry ice business of Pure Carbonic in the East.

Cyanamid is about to introduce to the trade an entirely new line of specialties for the tanning industry, thus adding to its already diversified list of heavy and industrial chemicals according to reports in the trade.

It is understood that the products just completed are "Astrulan" and "Ursulin" for fatliquoring leather. Both products possess the characteristics of neatsfoot oil and when used give the same mellowness to leather, a characteristic which has never been duplicated by any other oil.

Products are especially suitable for light colored leathers. Neither product imparts any color to the leather, and extensive tests by chemists have shown that leather treated by these products show very little if any discolorization on long storage or exposure to light.

Another product known as "Tanak" is said to be far superior to any and all of the numerous tannages in which synthetic tans are now successfully used. Following more than three years of intensive work, the company's research laboratory found that it was able to produce a product of high purity to be sold at a price well within range of crude commercial synthetic tans.

Coal Tar Chemicals

Import Statistics

April imports of synthetic dyes into U. S. totaled 232,741 lbs., valued at $229,078. This total compares with 300,144 lbs., valued at $259,425, imported in April, 1932.

Imports of synthetic aromatics in April were 64.5% smaller than those in April, 1932. Imports of color lakes were 58.8% smaller. Imports of other fine coal-tar chemicals were 94.5% larger than those in April, 1932.

Imports of Synthetic Dyes

	1933	
	Pounds	*Value*
January	314,878	$311,640
February	365,144	369,829
March	267,890	257,626
April	232,741	229,078
Totals	$1,180,653	$1,168,173
	1932	
	Pounds	*Value*
January	297,266	$259,558
February	429,298	367,154
March	482,545	410,865
April	300,144	259,425
Totals	1,509,253	$1,297,002

Countries of Origin of Dyes

	Percentages — *April*	
	1933	*1932*
Germany	62.73	69.67
Germany	34.25	29.26
Switzerland	2.97	.99
England	.05	.08
All others		

Leading Dyes	*Pounds*
Vat golden yellow GK double paste (single strength)	28,500
Ciba brown G paste	13,294
Acid cyanin BF	4,081
Vat printing black B paste	4,000

New Benzol Ruling

Treasury Department at Washington has announced that effective April 28, 1933, Federal gasoline tax of 1c per gallon is applicable on all sales of benzol, no matter for what purpose used. This revokes ruling of department of Aug. 5, 1932, which exempted all benzol except motor benzol from the tax.

Bureau's statement reads in part:

The bureau has reached the conclusion that the tax imposed under section 617(a) of the Revenue Act of 1932 is applicable to the sale of all products commonly or commercially known as "gasoline" or "benzol" regardless of the classification or use of these products. The ruling contained in bureau letter addressed to you under date of August 5, 1932, in which it was held that industrial benzol not suitable for use as a fuel for the propulsion of motor vehicles, motor boats, or aeroplanes is not subject to tax under section 617 of the Revenue Act of 1932 is hereby revoked.

In accordance with the foregoing, the tax imposed under section 617 is deemed applicable to all sales of industrial benzol made by the importer thereof, or by a producer of gasoline as defined in section 617(c) 1 of the Revenue Act of 1932, except (1) sales to producers of gasoline, (2) sales for export and (3) direct sales to States or political subdivisions thereof under the provisions of Articles 45, 10 and 9, respectively, of Regulations 44.

Japanese Benzol Production

It is estimated that production of benzol during 1932 in Japan amounted to approximately 20,000 metric tons, compared to 12,556 tons in 1931 and 16,209 tons in 1930. Yawata Steel Works, at present largest benzol producers, are expected to increase their output to 12,000 tons per year and other steel, coke and gas companies in Manchuria and Chosen as well as Japan proper are also reported to contemplate larger benzol output. There was, however, a scarcity of benzol for manufacture of dyestuffs due largely to demand for benzol in manufacture of military raw materials.

Exports Expand in 1933

Exports of coal tar crudes for first quarter of the current year were nearly $1,000,000 ahead of those of the corresponding period in 1932.

Shipments during the quarter, it is said, included 1,356,234 gallons of benzol, valued at $274,313 against 448,675, valued at $94,307, last year; 119,259 500 pound barrels of crude coal tar, valued at $279,486, against 93,288, valued at $216,-891; 88,964 tons of coal tar pitch, valued at $1,176,277, against 50,242, valued at $462,906, and 30,286 gallons of creosote oil, valued at $5,826, against 12,914, valued at $3,118.

Increase in benzol shipments, it was explained, followed a prolonged decline in exports. France was the chief purchaser during the first quarter of the current year for both benzol and tar products, the increase in the shipments of pitch being almost entirely due to exports of 79,960 tons to that country.

Imports were lower during the first quarter than a year ago, it was shown, receipts of creosote oil totaling 5,692,452 gallons, valued at $440,937, against 5,472,-906, valued at $517,646 last year, and imports of other crudes, totaling $164,934, against $197,570. Japan was the chief supplier of creosote oil, followed by the United Kingdom.

Imports of creosote oil into France increased from 13,777 tons in 1931 to 48,837 tons during the past year, while production showed a drop of 10% amounting to 9,000 metric tons in 1932, compared with 10,000 metric tons the year before. Exports totaled 1,635 tons in 1932, compared with 4,026 in 1931, the report states.

The French authority Rivat has reported to French Chemical Society that ultra-violet radiations (3,700 to 3,200 Angstrom units) accelerate formation of aniline black in a pronounced manner, permitting its production at normal temperatures. Through this method it has also been found possible to convert aniline oil itself into aniline black, but reaction is greatly speeded up in presence of usual catalysts, copper, cobalt, vanadium salts, etc.

Metals and Alloys

Prices Advance

A real bull market developed in the past 15 days in the metal markets. Copper has reached 7⅞-8c; lead, 3.95 at East St. Louis, zinc, 4.30, at East St. Louis, tin, 43½c.

Tungsten Co. of America, Seattle, has acquired holdings of Northwest Tungsten Co. and operations will start as soon as the required machinery can be placed.

Satisfactory results according to the *Chemical Trade Journal* (London) continue to attend the trials that are being carried out on the value of lanoline and lanoline mixtures as rust-preventing coatings on steel.

Kingman Smelting & Refining produced in March, (first month of production), about 2,000 lbs. of 98% vanadium. It is developing about four tons of ore daily at Kingman, Ariz.

Murray Corp. of America, Detroit, is marketing an insulated steel beer barrel.

Matthiessen & Hebler Zinc, La Salle, Ill., has taken the first steps in the formation of a national zinc producers' association.

Duriron, Dayton, Ohio, is marketing new metal alloy that is almost entirely resistant to hydrochloric at all concentrations and all temperatures up to boiling point. "Durichlor," new alloy, is comparatively inexpensive and is being used to make pumps, valves, pipe, fittings, jets, and other pieces of chemical handling equipment.

H. Boker & Co. of 101 Duane st., N. Y. City, are now prepared to offer to the trade their Nickel-clad Sheets in the thin gages, hot rolled, also in cold rolled with bright and polished finish.

Heavy Chemicals

Carbon Black Export Association

Organization of Carbon Black Export, Inc., by leading American producers of carbon black was announced May 27. Webb Act, under which the project was consummated, permits American manufacturers to form associations for the stabilizing of export prices and establishing sales quotas.

Subscribers to capital stock of new company are Columbian Carbon, United Carbon, Godfrey L. Cabot, Inc., J. M. Huber, Inc., Century Carbon, Panhandle Carbon, Texas Carbon Industries, Inc., and Palmer Carbon. Carbon black will be handled for export of these producers, as well as for the output of all other producers who may join the corporation later. Subscriptions to stocks are allotted largely on the proportion of each company's sales to that of the entire industry.

American carbon black industry virtually has a monopoly of world's production. In recent years tonnage sold abroad increased steadily despite the depression. Last year approximately 100,000,000 pounds, or 25% more than in 1929, were sold in foreign countries for about $4,000,000.

New corporation, it is believed, will attempt to eliminate the competition in foreign countries that caused the sharp decline in prices. Copper producers and several other American industries have in the past availed themselves of provisions of the Webb Act to stabilize export prices and establish selling quotas among producers.

A survey of carbon black appeared in CHEMICAL MARKETS in May, page 419.*

Victor Exhibits

Victor Chemical is exhibiting at the Chicago Century of Progress Exposition. Company's engineers have undertaken task of building in miniature an exact reproduction of the huge plant at Nashville. Not only is this model an exact replica of the Victor plant, but it presents, on a small scale, the plant in actual operation. There will also be exhibits of various products made from phosphoric acid, such as monocalcium phosphate, trisodium phosphate, sodium acid pyro phosphate, tricalcium phosphate, etc. Museum of Science and Industry, Chicago, has requested that this model be placed within it as a permanent exhibit for the benefit of present and future generations.

Southern Railway has petitioned Virginia State Corporation Commission for an increase in freight rates on sulfuric in tank cars between certain points.

*Survey of carbon black, appearing in May issue, stated no production existed outside of U. S. Small plant in Formosa is now operating.

Telegram sent to Secretary of Commerce Roper by Charles Belknap in reply to request for data on business conditions in the chemical industry.

Following is composite statement of telegraphic survey to representative companies chemical industry made in compliance with your request.

Number employes not appreciably increased, average hours worked per week has increased, but still necessary to utilize share-the-work plan to retain regular list of employes. Salaries and wages have remained unchanged since general reduction of 10 per cent., except for slight wage increase in isolated cases.

No change in price levels, some lines still trending down. Increase in production and sales occurring during last four weeks indicating an average increase of 20 to 25 per cent. over previous four weeks. Industry now operating on average 50 to 55 per cent. normal conditions.

Insecticides and fungicides excepted from above conditions, conditions therein still most unsatisfactory.

CHARLES BELKNAP,
Chairman Manufacturing Chemists Association.

United Carbon has received approximately $400,000 as result of private settlement of suits charged against Interstate Natural Gas. According to terms of settlement, Interstate Natural Gas agrees to increase its takings of natural gas by 25% under its contract with United Carbon.

Caustic Rates

N. Y. P. S. C. approved lower freight rates of N. Y. C. (East) and of the West Shore on caustic, in bulk, in barrels or iron drums, in metal cans, in barrels, boxes, cases or crates, carload, minimum weight in iron drums 60,000 lbs. and in other packages 40,000 lbs.; also on liquid caustic in tankcars, carload minimum weight as per rule 35, to stations on D. & H. at Port Crane to Delanson inclusive, Elmira to Meadowdale inclusive, and Waterford from Solvay and Syracuse, in tankcars 13c. and in packages 15c. per 100 lbs., and from stations East Buffalo to Suspension Bridge inclusive in tankcars 16.5c., and in packages 18.5c. per 100 lbs; effective June 1.

Production of aluminum salts in U. S. in 1932 was 312,862 short tons, valued at $7,593,835, a decrease of 11% in quantity and 13% in total value from 1931.

Makers of aluminum salts consumed 99,483 long tons of bauxite in 1932, valued at $1,087,000 at consuming works, and 2,713 short tons of aluminum hydrate.

Exports of aluminum sulfate from U. S. in 1932 were 21,550 short tons, valued at $462,954, compared with 27,668 tons, valued at $568,490, in 1931.

Standard Silicate, Cincinnati, has issued second edition of its booklet, "Cleaner Clothes," which contains detailed information and instructions for laundry operators as to the use of soda metasilicate. Copies may be obtained by addressing Standard Silicate Co., detergent dept., 414 Frick Bldg., Pittsburgh, Pa.

Payment of 75c per ton royalty on 41,877 tons of sulfur produced from deposit at Lake Peigneur brought Louisiana revenue of $31,407 during first three months of 1933. Bed of the lake is leased to the Jefferson Lake Oil.

Italian Sulfur

Montecatini estimates place sulfur production during 1932 at about 2,700 tons more than in 1931.

Sulfur Production (Metric Tons)

	1931	*1932*
Mainland	100,531	116,440
Sicily	255,186	240,000
Total	353,747	356,440

Montecatini Co. accounted for 102,355 tons of the mainland production, and according to present plans expects to keep 1933 extraction at the same level.

This company estimates 1932 exports of Sicilian and mainland sulfur at 33,400 metric tons more than in 1931, divided as follows:

Sulfur Exports (Metric Tons)

From—	*1931*	*1932*
Mainland	60,153	58,444
Sicily	180,380	215,488
Total	240,533	273,932

Total Italian sulfur sales, including domestic and export, were 347,085 tons in 1932 compared with 308,488 tons in 1931 and 315,000 tons in 1929 and 1930.

Monsanto's Japanese Order

Monsanto has received order for plans and specifications, and catalyst which they manufacture, for a large sulfuric plant to be built by Mitsui in Japan. Plant will rank in size among the largest in the world.

Plants operating under Monsanto licenses are located in several places in U. S. and in several European countries, as well as in Mexico, Persia, Chile, and Borneo, and one is now under construction in China. Monsanto does not contract to build these plants, but sells licenses, which include plant design and their patented vanadium mass catalyst, which has an advantage over the usual platinum mass in cost and efficiency. Monsanto's usual license fee is $700 per ton of daily capacity.

New Black Production

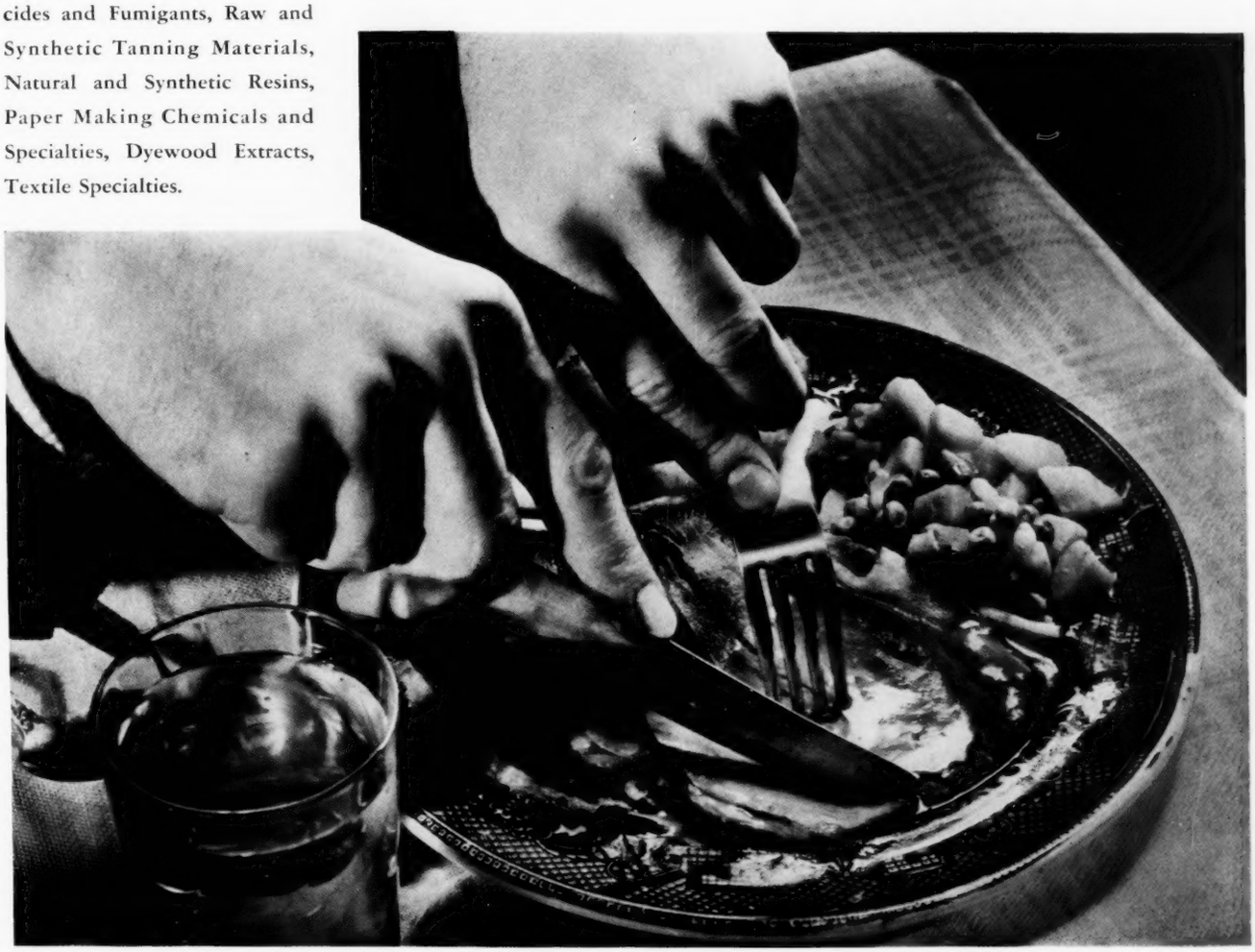
Commonwealth Consolidated Gas Co., Ltd., Los Angeles, is contemplating early construction of a carbon black factory, utilizing Dudley Ridge natural gas.

Company has offered to contract for purchase of 500,000,000 cu. ft. of gas per month. Company has a contract pending to furnish a large rubber company with 1,000,000 lbs. of black per month, according to one report.

When you eat

A forkful of food seems far removed from *industrial* activities and from American Cyanamid products; and yet it really is not. For when you eat, industries (among them your own!) are represented in the food itself and in all the accessory products . . . china, glass, silver, linen, cooking utensils, and so on. The many "fields" which are affected by daily human living are served by the many products of American Cyanamid & Chemical Corporation.

Acids, Heavy and Industrial Chemicals, Insecticides, Fungicides and Fumigants, Raw and Synthetic Tanning Materials, Natural and Synthetic Resins, Paper Making Chemicals and Specialties, Dyewood Extracts, Textile Specialties.



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PIGMENTS AND FILLERS

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535 Fifth Avenue . New York

Proposals for another absorption and carbon black plant for Turner Valley, (Calgary, Alta, Canada) involving expenditure of around $1,000,000, were discussed by independent oil operators in the past month.

Proposal was disclosed by M. Merriwether of Los Angeles, who announced a syndicate was preparing plans for construction of the plant next winter provided all independent operators would give their support, and suitable arrangements could be made.

Preliminary plans provide for production of 11,000,000 gallons of gasoline from the waste gas of the valley, and 18,000 tons of carbon black. A group of independent oil operators is studying a plan for an absorption and carbon black plant. Royalite Oil Co. put its absorption plant into operation May 1.

Sulfur Tax Unlikely

Prospects of raising tax on south Texas sulfur from 75c. to $1 per ton appeared remote when the House refused for the second time on May 5 to place measure for this purpose on the table subject to call. A similar effort previously had failed by the scant margin of two votes.

Failure to get the measure up from the calendar out of its order greatly lessens its chances of consideration during the short time remaining in this session. Sulfur tax bill was printed on minority report after the committee on revenue and taxation voted against it.

Salt Suit Heard

Decision to settle dispute between Jefferson Lake Oil, and State of Louisiana, and the Jefferson Island Salt Mining Co., may be expected in October, according to officials of Jefferson Lake Oil Co. Taking of testimony at New Iberia, La., has been completed. In lieu of arguments, briefs will be filed by attorneys, and are expected to be submitted to the court by the end of September.

Dispute concerns salt removed from Lake Peigneur, near New Iberia. Jefferson Lake Oil Co., Inc., and the State contend that State surveys establish definite boundaries of the salt companies' lease at the edge of the lake, and that the salt company owes for all salt removed therefrom outside the boundaries. The amount involved is approximately $5,000,000.

Italian 1932 pyrites production was 128,400 metric tons less than in 1931. Smaller output enabled a reduction of pyrites stocks from 100,000 tons in 1931 to 30,000 tons in 1932. Montecatini mines contributed 82% and owing to opening of mines at Niccioleta and Rigoloccio, company will increase its 1933 output.

There is no local manufacture of anhydrous ammonia in China. Supplies are imported chiefly from U. S., Germany and Great Britain. Total imports (not including Hong Kong) in 1932 were 206,850 lbs., valued at $26,946 (U. S. currency).

Japanese Bleaching Powder Producers Association in Japan has agreed to continue production curtailment rate of 30% through March. Total 1932 output was 42,685 metric tons. Nihon Chisso, K. K., Osaka, has taken over from Osaka Soda patent rights for manufacturing caustic soda and plans to turn out 500 tons monthly.

Southern Solvents, Inc., Munsey Building, Baltimore, organized to deal in alkalies and chemicals; capital stock, 10,000 shares, par value $1 each. Incorporators Kenneth M. Livingstone, Sylvester Mettenburg and Clarence W. Tabler, all of Washington, D. C.

Italy produced 99,567 metric tons of $CuSO_4$ in 1932, an increase of about 29% over 1931 production. There are eight producers in Italy with an annual capacity of about 160,000 tons. Two-thirds of the production is controlled by Montecatini. Imports during 1932 totaled 7,463 metric tons.

Copper sulfate is being produced to an increasing extent in India, but imports chiefly from U. S. and Germany. Chief consumers are the tea and rubber planters. They employ the material in agricultural sprays.

Imports during the fiscal year 1931-32 totaled 882 long tons, as compared with peak imports of 1,217 tons in 1929-30.

Glass & Ceramic Notes

Consolidated Feldspar, Trenton, N. J., reports better shipments of feldspar to the glass trade as a result of demand for beer bottles. Company has completed installation of special grinding equipment at Erwin, Tenn., plant for production of granular feldspar employed in glass industry . . . Next American Ceramic Association meeting will be held Feb. 11-16, 1934 at the Netherland Plaza, Cincinnati. Richard B. Carothers of the H. C. Spinks Clay Co. is vice-chairman of the Cincinnati committee . . . Whitall Tatum is opening up another plant . . . Owens-Illinois has purchased Hemingwray Glass of Muncie, Ind.

Solvents

Commercial Solvents Wins

Judge John P. Nields in Federal Court May 23 held Union Solvent in contempt of court on a charge of having violated an injunction of the court. Union Solvents was enjoined by the court here last year from using the bacteriological process in making butyl alcohol and acetone, similar to the Wiezmann process as used by Commercial Solvents.

Commercial Solvents, plaintiff in the original patent case, recently charged that Union Solvent's violated the injunction. Union Solvent's defense was that its bacterological process used since the injunction was the Fernbach, utilizing bacteria that had come from France. Judge Nields, however, held from evidence in the contempt proceedings that Union Solvents process was similar to the Commercial process found to have been infringed. Union also must pay Commercial Solvents damages, to be ascertained by a master. The case has been one of the most bitterly fought in the history of the chemical industry.

Wafer With Rossville

Joseph Wafer on June 15 will sever his connection with Industrial Chemical Sales, to become sales manager for Rossville Commercial Alcohol.

This is the second time Mr. Wafer has gone to Rossville from Industrial Chemical Sales. In his previous connection with the alcohol company he was sales manager of the chemicals division.

U. S. I. stockholders have approved reduction of the stated capital of the company from $22,584,600 to $3,738,460, thereby creating a capital surplus of $18,846,140. Stockholders further approved transfer of the capital surplus so created to property reserves, together with an additional amount of $454,903 which will be charged against earned surplus, the whole resulting, when reflected in the consolidated balance sheet, in the reduction of the net book value of the fixed assets to $1.

C. P. Mills, former N. Y. State Prohibition Administrator, John P. Allen, president of TriBoro Chemical, Brooklyn, and several others have been indicted on a charge of conspiring to divert large quantities of denatured alcohol into illicit channels.

Robert J. King, Stamford, Conn., manufacturers of chemical solvents used in rubber industry, has been incorporated under the laws of Connecticut with paid-in capital of $42,500 in property. Robert J. King is president; Currier Lang, vice-president and treasurer, and R. K. Colwell, secretary. The company's plant is located on Sunnyside ave., Stamford.

Naval Stores

Cup Sales Analyzed

Bureau of Chemistry and Soils, reports that a total of 11,088,333 cups were sold last winter for use in gathering 1933-34 naval stores crop. Not since 1930-31 have anywhere nearly so many cups been sold in a season, average sales for two preceding seasons having been only slightly more than 2,000,000 cups. Average number of cups sold for the eight years, 1923-31, approximated 18,650,000 or 1,865 crops of new cups each season.

Although number of cups sold for current season has risen sharply, replacement of cups in past three seasons fell much below eighty-year average and it is evident, bureau points out, that there are many old rusty cups still in service, though the information coming to the bureau during the past winter indicates that a considerable number of these old cups have been treated in various ways to decrease the damage they would otherwise do to the grade of rosin made from the gum collected in them.

Sales of new cups for the last 11 seasons were as follows:

1933-34	11,088,333
1932-33	3,620,000
1931-32	1,085,000
1930-31	11,178,800
1929-30	24,488,760
1928-29	12,589,000
1927-28	32,310,000
1926-27	20,500,000
1925-26	10,059,000
1924-25	13,249,000
1923-24	24,828,500

Census of Manufacturers—Turpentine and Rosin for 1931—is available from Supt. of Documents, Washington at 5c a copy.

Greater consumption by foreign countries of pine oil has caused a gradual increase in shipments of this product. Exports of pine oil during 1932 amounted to 435,013 gals., valued at $246,145, as compared with 390,590 gals., valued at $223,652, during preceding year.

April production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand April 30, according to data collected by producers' committee, through Arthur Langmeier, of Hercules Powder Co., secretary, were as follows:

Production

	Rosin 500-lb. barrels	Turpentine bbls. 50 gallons	Pine oil Gallons
Month of Apr.	24,926	3,831	184,760
Total from April 1, 1933..	24,926	3,831	184,760

Stocks at Plants

Totals, Apr. 30, 1933	86,406	10,863	2,185,920
Mar. 31, 1933	98,615	12,387	2,171,030
Change	—12,209	—1,524	+14,890

Note—Rosin production and stocks include all grades of wood rosin.

EXPORTS FROM U. S. TO ALL COUNTRIES

GUM AND WOOD

	Turpentine	Rosin
1933	18,726	88,729
1932	18,943	103,838
1931	12,689	85,007
1930	12,871	83,162
1929	16,036	79,273
1928	7,547	56,713
1927	12,887	88,951
1926	9,869	55,236
1925	10,825	76,244
1924	7,205	101,890

General Naval Stores has appointed C. R. Slensby Co., 312 E. Wisconsin ave., Milwaukee, Wis., distributor in Milwaukee territory.

Sir Edwin Flood, 75, outstanding British naval stores leader, head of Fairclough, Dodd & Jones, London, died last month.

Waterproof fiber liners for old turpentine cups, which the manufacturers claim raise grading of the gum, are being offered by the Sonoco Products Co., Hartsville, S. C.

Carson Naval Stores reports that for April, 1933, net return at still for barrel spirits turpentine was $17.17, for barrel of rosin $3.84, and for unit of one barrel spirits turpentine and three and one-third barrels rosin $29.97.

Methods for determining viscosity of rosin, also of sampling and testing, are among reports to be read at annual meeting of the American Society for Testing Materials, Chicago June 26-30.

Fine Chemicals

Mallinckrodt at Chicago

Two exhibits of unusual interest are being shown by Mallinckrodt, at the Chicago Century of Progress Exposition. One is designed especially for the medical profession and the other was planned to make a more general appeal, demonstrating graphically multitude of uses for fine chemicals, and showing by displays the wide variety of products whose manufacture is dependent on these chemicals.

Naugatuck Chemical has added 30 employees and has increased three shifts of six hours each to eight hours each.

Eastman Kodak's May *Synthetic Organic Chemicals* contains a list of 35 new organic chemicals now manufactured and listed in new Eastman catalog.

Givaudan-Delawanna has completed first issue of monthly organ "The Givaudanian."

In 1932 bromine recovered in U. S. by producers from natural brine and bromine content of bitterns used by producers in manufacture of bromine compounds was 5,727,561 lbs. valued at $1,182,569. This was a decrease of 36% in both quantity and value from output of 8,935,330 lbs. valued at $1,854,650 in 1931. Michigan, California, West Virginia, and Ohio were the states producing bromine. Quantity and value of imports of bromine and bromine compounds in 1932 were as follows:—Bromine, 27 lbs., $27; ammonium bromide, 52 lbs., $10; potassium bromide, 37,480 lbs., $9,039; sodium bromide, 2,205 lbs., $453; ethylene dibromide, 960,610 lbs., $191,991; "other bromine compounds," 16,153 lbs., $7,311.

Iodine was produced in U. S. in 1932 in California and Louisiana, but because of the small number of operators Bureau of Mines is not at liberty to publish figures of production. Imports of crude iodine in 1932 amounted to 631,669 lbs., valued at $2,225,661, an increase of 127% in quantity and 123% in value, compared with 1931. A small quantity of resublimed iodine (100 lbs., $269), was also imported.

Imports of synthetic camphor during first quarter of 1933, all of which was from Germany, aggregated only 65,974 lbs. valued at $16,625, as compared with 500,209 lbs. worth $135,619 in the corresponding period of 1932.

Receipts of natural crude camphor (from Japan) totaled 460,052 lbs., $86,260 in the current quarter against 609,786 lbs., $186,180 in the 1932 period, while imports of natural refined camphor totaled 305,085 lbs., $100,437, contrasted with 531,291 lbs., $201,242 in the above respective periods.

German exports of bismuth salts expanded notably in 1930, rising to 99.7 metric tons, from 86.1 in 1929. Since 1930, however, trade has contracted greatly, dropping to 59.2 tons in 1931, and undergoing further decline, to 53.3 tons in 1932. In point of value the decline has been much more pronounced.

Increasing competition following dissolution several years ago of former international bismuth salts convention, comprising producers in Germany, England, France, Italy and Holland, is understood to have been largely responsible for the drop in market prices.

Oils and Fats, Waxes

Corn Oil Competition

Cottonseed products producers were warned of looming competition of corn oil by R. T. Doughtie, president of the National Cottonseed Products Association, in opening organization's convention at New Orleans May 15.

Other speakers included Christie Benet, association counsel; J. Ross Richardson, chairman, rules committee; Secretary S. M. Harmon and Treasurer George H. Bennett who read reports; T. O. Asbury, chairman, Committee on Qualifications and Regulations for Official Chemists; T. C. Law, chairman, chemist committee, and E. R. Barrow, research committee chairman.

J. Ross Richardson, Houston, Texas, was elected president, to succeed R. T. Doughtie, Helena, Ark. T. H. Gregory, Memphis, was named vice president.

Tung Oil in March

Exports of tung oil from Hankow, China, amounted to only 4,358,000 lbs. in March, compared with 13,834,000 lbs. in February and 12,434,000 lbs. in March 1933.

Of the total March shipments, U. S. share in the export trade amounted to 1,694,000 lbs., which quantity compared with 11,050,000 lbs. for the preceding month and 9,968,000 lbs. for March, 1932. Of special significance is the fact that Europe purchased a larger quantity than U. S., taking 2.664,000 lbs. in March, 1933.

At the end of March stocks on hand at Hankow were estimated to be 2,600 short tons. Total exports for first three months of the current year equal 27,696,000 lbs., compared with 32,168,000 lbs. last year. In the same periods shipments to U. S. were 19,328,000 lbs. and 26,190,000 lbs., respectively.

A new association is being proposed in place of the defunct Auckland Kauri Gum Control Board.

Perkins Oil, Memphis, is opening a new cottonseed mill at West Memphis, Ark.

Germany has planned a subsidy to restrict imports on flax. . . . Soybeans will not enable farmers in eastern North Carolina and Virginia to get rich, but they do provide a profitable crop, according to Prof. Walter B. Krueck of the Allied Mills at Norfolk, Va.

Linseed Figures for First Quarter

Linseed oil production in U.S. was at a low level for the first quarter of current year, with a total of 79,563,929 lbs., compared with 99,783,339 for corresponding quarter last year. Output for quarter, was but little more than a third of high figure of 223,750,569 lbs. produced in first three months of 1928.

Flaxseed crushings during quarter totaled 122,178 tons, against 151,007 tons in same period last year and 332,777 tons in first quarter of 1928. Stocks of flaxseed at mills on March 31 amounted to 46,101 tons, compared with 42,082 tons on same date last year, and stocks of linseed oil were 110,454,878 lbs., against 132,987,004 lbs., report showed that 22 mills were active during quarter.

Leo Schnurmacher, Inc., broker in copra and coconut oil, 61 Juan Luna, Manila, P. I., has issued new set of three charts of statistical data on copra and oil trade of the Philippines in 1932.

Baker's New Booklet

Baker Castor Oil, 120 Broadway, N. Y. City, has prepared pamphlet "Baker's Emulsion Oils for Automobile and Furniture Polish." These oils are known as "Emulsion A," "Emulsion B," and "Emulsion C." Copies may be obtained from company offices.

Story of the Zucker-Columbia University process for extracting vitamin D from cod liver oil and incorporating it in foods, has been made the subject of a two-reel motion picture film by National Oil Products, of Harrison, New Jersey.

Frank B. Ross Co., Inc., wax importers, N. Y. City, has completed a very interesting report concerning the carnauba wax market. Copies are available by writing company offices at 79 Wall st.

Glyco's Turkey Red

A new type of sulfonated or turkey red oil is now available under the designation of Sulfo Turk C by Glyco Products. It is said to give clear solutions in mineral oil and hydrocarbons, and forms bright soluble oils which form milky emulsions with water.

Sulfo Turk C has a lower moisture content, a high viscosity, greater length and shows less tendency to sweat out of miscellaneous combinations. It does not dry out nor will it tend to produce a haze or bloom when used in polishes. As a matter of fact it produces glossier coatings.

Emulsions made with it foam and froth much less than those made with ordinary sulfonated oils. Its resistance to hard water is excellent. It has a pleasant fruity odor and does not become rancid. When used with adhesives as a flexibilizer it does not cut down adhesiveness to the same extent as ordinary turkey red oils.

A tung oil demonstration farm is being established at Picayune, Miss., by J. C. Holton, State Commissioner of Agriculture.

William B. Prescott, once associated with the Massachusetts Cotton Mills of Lowell, Mass., and later in the cotton business has become connected with Warren Soap, Cambridge, Mass.

Cottonseed Statistics

	On hand August 1	*Produced Aug. 1 to April 30*	*Shipped out Aug. 1 to April 30*	*On hand April 30*
Crude oil, pounds—				
1932-1933	*29,523,581	1,263,946,800	1,195,682,540	*122,517,427
1931-1932	8,086,071	1,555,951,926	1,476,351,371	118,132,055
Refined oil, pounds—				
1932-1933	†628,420,148	‡$1,037,310,406	.....	†804,201,303
1931-1932	277,836,530	1,306,501,305	.....	705,371,493
Cake and meal, tons—				
1932-1933	114,656	1,838,240	1,731,443	221,453
1931-1932	146,888	2,214,851	2,204,720	157,019
Hulls, tons—				
1932-1933	162,773	1,151,795	1,219,859	94,709
1931-1932	47,723	1,309,218	1,230,389	207,552
Linters, running bales—				
1932-1933	235,521	643,044	624,579	253,986
1931-1932	175,904	798,310	691,243	282,971
Hull fiber, 500-lb. bales—				
1932-1933	4,138	16,277	8,202	12,213
1931-1932	3,564	31,574	29,671	5,467
Grabbots, motes, etc., 500-lb. bales—				
1932-1933	15,250	22,848	23,223	14,875
1931-1932	12,475	28,437	20,672	20,240

*Includes 4,182,006 and 15,387,967 pounds held by refining and manufacturing establishments and 7,235,770 and 20,759,395 pounds in transit to refiners and consumers August 1, 1932, and April 30, 1933, respectively.

†Includes 4,652,177 and 5,176,834 pounds held by refiners, brokers, agents, and warehousemen at places other than refineries and manufacturing establishments, and 5,598,691 and 3,426,770 pounds in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1932, and April 30, 1933, respectively.

‡Produced from 1,127,489,963 pounds of crude oil.

Eight Months Exports up to March 31

		1933	*1932*
Oil, crude	pounds	30,659,647	30,182,052
Oil, refined	pounds	5,840,884	4,405,450
Cake and meal	tons of 2,000 pounds	139,335	188,031
Linters	running bales	109,488	79,709

Paints, Lacquers and Varnish

Association Manager Dies

George Vincent Horgan, 55, general manager and secretary of N. P., O. and V. Association, and the A. P. and V. Mfrs. Association, died in Washington, May 25.

Mr. Horgan, born in Oswego, N. Y., formerly was secretary to John B. Stanfield, one of the leading trial lawyers of his day, and held various positions with the Erie and Lackawanna railroads, the N. Y. Public Service Commission and the Buffalo Chamber of Commerce. During the World War he was manager of the personnel division of the Chemical War Service, and in 1919 he became secretary to the Trade Association.

In 1926 he became general manager of the A. P. and V. Mfrs. Association. The annual award of the American Trade Association Executives was conferred upon him last year "for successfully operating a comprehensive, well co-ordinated and effective program in the interest both of the public and the industry."

Mr. Horgan served one term as president of the Trade Association Executives of N. Y. He was a member of the Union League Club of N. Y.

Fall Paint Plans

While the Fall Clean Up and Paint Up Campaign always has been one of the basic factors in the Clean Up and Paint Up program, conditions this year are giving an impetus for Fall Campaign activities much earlier than heretofore. As early as March, the Lowell, Mass., Chamber of Commerce decided upon a program of two intensive Clean Up and Paint Up drives a year, while the Spring Campaign was still in process of organization. The example was rapidly followed by other local organizations, in different parts of the country. The U. S. Junior Chamber of Commerce has notified the National Clean Up and Paint Up Campaign Bureau that the Fall Clean Up and Paint Up Campaign will be the subject of special consideration when the annual convention of Junior Chambers of Commerce of the U. S. is held in St. Paul, Minnesota, June 21. Practically every Junior Chamber of Commerce is cooperating either directly or with the Senior Chambers of Commerce.

The tremendous backing up in painting activities during the past three years has now enabled the Clean Up and Paint Up campaigners to make property owners especially conscious of the need for paint, with the result that the all year round Clean Up and Paint Up movement is gaining an exceptional welcome in 1933.

Special plans for the promotion of Fall Campaigns are being developed by the National Clean Up and Paint Up Campaign Bureau.

March F. Chase is a new Commercial Solvents vice president.

Telegram sent to Secretary of Commerce Roper by G. B. Heck in reply to request for data on business conditions in paint, varnish and lacquer industries.

Total paint, varnish and lacquer manufacturers approximately 1,000. Census output 1932 about $350,000,000. Affiliated associations comprise about 400 members, representing at least 75 per cent. of production.

Business and employment both trending upward. Prices have been demoralized because all consultation debarred by law. American Paint and Varnish Manufacturers' Association attacked several years ago by Department of Justice, but indictment not found. Under proposed new law, association could readily eliminate abuses which it has been fighting since its formation in 1899.

Labor employed largely skilled and technical. No history of labor troubles in this industry. Employment now about half normal, but rapidly increasing.

G. B. HECK,
Secretary American Paint and Varnish Manufacturers' Association.

Paint, Varnish and Lacquer Sales: March

Sales of paint, varnish and lacquer products in March totaled $4,364,702 in value, according to preliminary report of U. S. Bureau of Census from data supplied by 588 establishments. This compared with a revised total of $12,345,600 in February and $19,089,005 in March last year. A record of sales in March compared with revised figures for January and February and also a record of sales by month during 1932, follows:—

		Classified sales reported by 344 establishments				
		Industrial sales			*Trade sales of paint, varnish lacquer*	
1933	*Total sales reported by 588 establishments*	*Total*	*Paint and varnish*	*Lacquer*		*Unclassified sales reported by 244 establishments*
January*	$11,946,271	$3,529,916	$2,386,977	$1,142,939	$4,163,960	$4,252,395
February*	12,345,600	3,417,387	2,439,732	977,655	4,767,355	4,160,858
March†	14,364,702	3,387,723	2,480,590	907,133	5,794,335	5,182,644
1932						
January	15,894,506					
February	16,270,822					
March	19,089,005	Comparable statistics not available.				
April	22,612,193					
May	24,981,441					
June	19,637,358	4,685,399	3,617,719	1,067,680	8,734,330	6,217,629
July	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
August	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
September	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
October	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
November	13,260,328	3,599,319	2,639,362	959,957	5,196,766	4,464,243
December	10,127,780	3,222,770	2,186,706	1,036,064	3,406,715	3,398,295
Totals, year	$204,734,085	.....	.....	.....	.....	.....

*Revised. †Preliminary.

O. P. Clipper, of Glidden, was named as presidential choice of the nominating committee of the Chicago Paint and Varnish Production Club at its May meeting, held May 1, at the Midland Club. Fred Seder, of Hooker Glass & Paint Mfg. Co., was named as vice-president; T. J. O'Connor, of James B. Day & Co., secretary, and R. C. Linnell, Illinois Paint Works, treasurer.

Detroit Color Works, is now turning out lines of their products in both paints and varnishes, under the names of two new subsidiaries, Reliance Paint and Varnish, and Klimatic Paint.

E. A. de Campi, former assistant manager of Chicago branch of National Lead, has been appointed manager to succeed Charles E. Field, who retired as manager and director of the company, April 20.

Charges of unfair competition in importation of iron oxide pigments from Canada were heard by the Tariff Commission on May 10 and 11.

Charges upheld by Magnetic Pigment, N. Y. City, which filed the complaint, were denied by Northern Pigment of New Toronto, Canada, the producer; and by Bruce Ross, Ltd., Toronto; and C. J. Osborn Co., and Stanley Doggett, both N. Y. City distributors.

Charges chiefly involved patent infringement, although there were references to similation of trade-marks and selling below cost of production.

Ralph H. Everett, vice-president Keystone Varnish, was elected president of the New York Paint, Oil and Varnish Club at the annual dinner meeting May 11. Mr. Everett succeeds Ralph M. Roosevelt, of Eagle Picher Lead, who was chosen vice-president. George H. Miles, of Federal Composition & Paint was chosen secretary, succeeding Robert Boggess, of Spencer Kellogg, and Hendrick E. Hendrickson, of S. Winterbourne & Company, was re-elected treasurer.

Andrew L. Somers, president of Fred L. Lavanburg, and member of Congress, and chairman of the club's legislative committee gave a talk on current legislative matters.

Horace E. Payson, 82, president of Payson Varnish, died at Larchmont, N. Y., on May 9.

A. W. C. Harrison, eminent British paint chemist, chief technologist of Wm. Harland & Sons, paint and varnish manufacturers of Merton, England, noted lecturer and author on paint technologist, died late in April, according to British chemical trade journals.

Zinc Oxide of Canada, Ltd. of Montreal, a subsidiary of a French chemical manufacturing company, has established plant in the eastern section of the city.

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and other Heavy Chemicals of Standard Purity

294

Textile Chemicals

The New Dyes

Du Pont Dyestuff Division is offering sulfogene Fast Black CL, which is similar to Company's Sulfogene Carbons but possesses superior fastness properties. It is superior in resistance to chlorine, acid cross-dyeing, steaming, ironing and much less likely to tender goods on prolonged storing than the ordinary sulfur blacks. Sulfogene Fast Black CL dissolves readily, penetrates, levels and exhausts well, and, being unaffected by iron or monel metal, may be used in all types of machines employed for sulfur colors. It is particularly recommended for dyeing hosiery, warps, sewing threads, mercerized yarns, raw stock, piece goods, awnings, drillings and similar materials that must stand exposure.

National Aniline Offerings

National Aniline is offering National Carbanthrene Printing Black J, in the form of double paste, patented by the manufacturer. It is a recent addition to the line of printing blacks for cotton which produces a vivid rich black, and which reduces satisfactorily to a desired neutral gray, a characteristic not usually found in former types.

National Diazine Black S extra is another dye for cotton possessing fastness qualities, together with a full, rich and bloomy black. Its fastness to light is better than that of corresponding types.

The same manufacturer also has added Vat Pink FF in paste form for the printing of cotton; Carbanthrene Brown AR double paste and Carbanthrene Golden Orange 4R double paste, all of which possess the necessary qualities of light and washing fastness, solubility and level dyeing.

General Dyestuffs Contributes

General Dyestuff is offering Diazopon A—a product added to the developing bath of Naphthol AS dyeings and said to result in improved resistance to rubbing. Diazo Brilliant Green 6G—a homogeneous color which with Developer ZA produces bright yellowish greens said to be dischargeable to a perfect white. Fastusol Black VE—direct dyestuff said to be fast to light similar in shade and properties to Benzo Fast Black LA, but is said not to reduce in boiling. Palatine Fast Red BRE—a new brand of the Palatine Fast series, principal feature is said to be its very level dyeing property and it is claimed that it is the best red to be used in combination shades.

Phoenix Testing Laboratory, 166 E. 27 st., N. Y. City, formerly a department of Phoenix Silk Mfg., has been taken over by Fred Schaefer Co., manager.

Thirty-fourth annual reunion of alumni association of Lowell Textile Institute was held at the school Saturday, May 20. President Charles H. Eames addressed the alumni members. Charles H. Forsaith, '20, was general chairman and the subchairmen were: Chemistry and dyeing, Prof. Charles Howarth, '17; engineering, Alexander Campbell, '23; cotton manufacturing, Richard Rawlinson, '21; wool manufacturing, Philip Warren, '23.

The N. Y. section held its spring meeting May 2 in Firenze Restaurant, 6 W. 46th st., N. Y. City, Adolph J. Winkler, president, presiding.

R. C. Jones, purchasing agent of the Hopewell, Va., unit of Tubize-Chatillon, succeeds C. E. Baldwin as agent and manager of the company's plant at Rome, Ga.

C. S. Servais, Mr. Jones' assistant at the Hopewell unit, will come to the Rome plant as purchasing agent, succeeding H. L. Boss.

A. A. T. & C. Piedmont section's spring meeting was held May 14 at Greensboro.

Du Pont's Dr. R. E. Rose, president of the national association, was guest speaker. Day's activities began with a technical session, the program for which was as follows:

"Color Shop Problems in Cotton Printing," by J. H. Easley; "Hosiery Dyeing and Finishing," by L. M. Boyd; "Treatment of Water for Boiler and Textile Purposes," by C. D. Blackwelder; "Recent Developments in Application of Fast Colors," by S. H. Williams.

Celanese has given an immediate wage increase of 5% in the Cumberland, Md., plants. Company has nearly doubled number of fulltime employees since April 1 and plans further to increase it considerably in the next few months.

Warren P. Seem, Julius Kayser, lectured on the "Projectorscope" at the May meeting of the N. Y. Section, A.A.T.C.&C. June meeting will be held as an outing.

Pharma Chemical has recently commenced production of Milling Yellow R.

New Waterproofing Agent

General Dyestuff is marketing new waterproofing product under name of Ramasit K Conc., which is applied by the one bath method. It is just stirred with warm water and without any addition of aluminum salts, is ready for use. It is equally suitable for wool, silk, cotton, rayon and mixed fabrics. Firmness of the texture is fully retained. Raindrops run off the surface at once without spreading, and the material is waterproofed. Ramasit imparts a full and soft handle, and does not alter the porosity.

Celanese Corp. of America directors on May 1 declared a dividend of $1.25 per share on the 7% cumulative series prior pref. stock, par $100, thus completing the payment of all of the arrears in dividends on said stock, payable May 19, 1933 to holders of record May 12, 1933.

Last regular quarterly distribution on this issue of $1.75 per share was made on April 1.

Textile Dyeing & Printing, Fairlawn, N. J., has approved plans for a new two-story dye house addition, reported to cost about $24,000, with equipment.

Work on a $175,000 water supply project for dye works at Deepwater Point, N. J., of du Pont will start soon, according to officials.

Construction of new "experimental" knitting plant is under way at Hopewell, Va., and will be ready for operation about June 15 by Tubize Chatillon. . . . Rayon industry is again operating at 100% of capacity as a result of the flood of buying orders growing out of the spring upturn in business. Nearly all of the important producers are sold up for several months. . . . Japan Rayon Association reports that total export trade of rayon textiles during March amounted to 5,854,000 yen. . . . Tootal, Broadhurst, Lee Co., Ltd., are now offering a non-crushable all-rayon organdie. . . . North Carolina A.A.T. & C., Student Section had as its guest recently Harold Faust, manager of the Greensboro Laboratory of Ciba. . . . Herrick & Voigt have moved N. Y. City office to 21 West st. Telephone number BOwling Green 9-2582 and 3. . . . Walker Dyeing & Bleaching, Chelsea, Mass., has been granted a certificate of incorporation. Firm is capitalized for $50,000. Officers: President, Howard Walker; treasurer, Chester S. Walker, Cambridge, and Henry F. Wood. . . . Charles Coan, for a number of years with Klipstein and until lately with E. J. Feeley, Inc., Boston, has become associated with American Aniline Products, traveling out of their Boston office. . . . D. S. Collard has joined Warwick Chemical of West Warwick, R. I., as an expert in silk throwing and soaking and rayon. . . . Harold Bennett (Melrose Chemical head) spent some time at his Nova Scotia hunting lodge in May. . . . Waltham Bleaching & Dyeing, Waltham, Mass., organized in February to take over old Waltham Bleachery & Dye Works, has finished its first million yards of cloth. . . . Geigy's Clifford Hilton has just returned from a trip to Europe.

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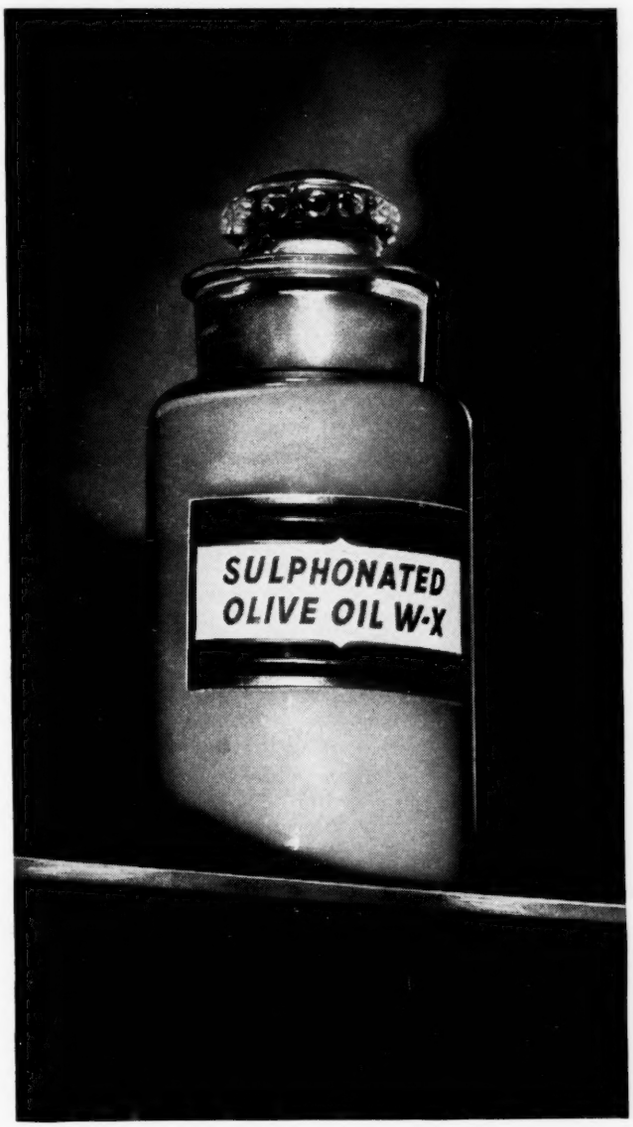

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Other vitally important factors are its low acid value, remarkable penetration, resistance to salts, low neutral fat, stability and high SO_3 content.

Several large finishing plants have already reported unusual results in finishing fine fabrics with this new and improved sulphonated olive oil.

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Fertilizers

Miller Sues

C. Wilbur Miller, former Davison Chemical president, has filed suit in Washington Superior Court for damages of $5,000,000 against 14 defendants. Grounds are not given. Defendants include Sir Auckland Geddes, international financier, who is chairman of the board of Rio Tinto Co., Ltd., also named as a defendant; Pyrites Co., Inc., Chase National Bank, A. H. Wiggin, Continental Illinois Bank & Trust, Richard M. Preston, managing director of Rio Tinto Co., William Setuin, president, Pyrites Co., John N. Buchanan, Thomas Robbins, John J. Watson, James Bruce, president of Baltimore Trust Co.; G. Ridgley Sappington, attorney for the Baltimore Trust Co., and Harry E. Treide, receiver for Davison Chemical. The latter succeeded Mr. Miller to the presidency of Davison Chemical a few months before the receivership action.

Suit requesting appointment of receiver for Davison Realty, subsidiary of Davison Chemical, was filed in Baltimore, May 9, Circuit Court by Kennedy G. Rogers, with request that court take jurisdiction over company's property.

A petition for receivership of the same company was filed in U. S. District Court March 15. It has not yet been acted upon. Replying to this suit, receivers for the chemical company, Henry E. Triede and Chester F. Conkley, stated that a separate receiver was not necessary for the realty company because it was wholly owned and controlled by parent company. Judge Charles F. Stein issued order directing defendant corporation to show cause by May 16 why a receiver should not be appointed.

American Potash & Chemical has just issued a very attractive booklet describing the layout and operations of the Trona plant. Copies are available from the company's main offices, 233 Broadway, N. Y. City.

Independents Meet

Independent Fertilizer Association, in session at the Mayflower Hotel May 17, re-elected present officers.

C. T. Melvin, vice-president, Gulf Fertilizer, Tampa, Fla., was re-elected president while F. H. Tunnell, president, F. W. Tunnell & Co., Inc., Philadelphia, and J. S. Whittington, N. Y. City, are vice-president and secretary-treasurer respectively.

With the largest attendance at an annual meeting in recent years, expressions of optimism on the outlook for the future in the industry were general.

Present were Charles Brand, co-administrator of the Roosevelt-Wallace Agricultural Adjustment Act, and C. H. Dempwolf, Sr., president, York Chemical Works, York, Pa., honorary member of the association.

Charles J. Brand, N. F. A. secretary and D. A. Dashiall, Royster Guano traffic manager, appeared May 17 before the I. C. C. to urge lower freight rates on fertilizer to enable railroads to win back tonnage lost to trucks.

Judge Henry L. Grady of the Superior Court, appointed L. A. Pinchon, of Wilmington, N. C., on May 6, temporary receiver for Josey Guano. Mr. Pinchon is secretary and treasurer of the company.

Lowell Fertilizer strike ended May 12 when 200 workers accepted wage increase of 25% in hourly scales, which had previously been rejected.

Pennsylvania has passed amendment to state fertilizer law which increases standard of complete fertilizers from 14 to 16 units of total plant food. Amendment takes effect on Jan. 1, 1934.

Chairman Manire of District 8, of the N. F. A. reports Dr. G. S. Fraps, Texas State Chemist, has appointed a committee to select a place for the meeting of fertilizers manufacturers to decide upon analyses for registration during the fiscal year Sept. 1, 1933 to Aug. 31, 1934. Committee is composed of P. H. Manire, Chairman, Marshall Cotton Oil, J. D. Dawson, Jr., Fidelity Chemical, M. S. Wright, Texas Fertilizer.

Import Statistics

Imports of fertilizer materials during April totaled 102,204 long tons, compared with 61,433 long tons for April, 1932, an increase of 66%. Large increases were noted in the imports of nitrogenous and potash materials. Imports of sodium nitrate amounted to only 66 tons, compared with 2,675 tons for April, 1932. Following materials were received in smaller volume than for April, 1932: tankage, bone phosphates and superphosphates.

Exports of fertilizer and fertilizer materials during April totaled 69,580 long tons, compared with 71,614 long tons for April, 1932. Exports of nitrogenous materials totaled 4,239 tons, compared with 11,063 tons for April, 1932. Potash fertilizers showed a large increase over last April, while the exports of superphosphates declined sharply.

Imports of fertilizer materials during first four months of 1933 were 15% larger than those for the first four months of 1932, a decrease of 3%. Imports of ammonium sulfate totaled 169,605 tons, against 88,448 tons for the first four months of 1932. Imports of sodium nitrate amounted to only 3,093 tons, compared with 44,270 tons for first four months of 1932 and more than 300,000 tons for the first four months of 1931.

Exports of fertilizers during first four months of 1933 were 17% smaller than the exports for the first four months of 1932. Nitrogenous materials were reduced more than 50%. Phosphate rock exports were only slightly smaller, while exports of superphosphate were sharply reduced. Exports of potash fertilizers showed a large increase for the period.

April Fertilizer Tag Sales

	Equivalent tons*							
	April				January-April			
	P.C. of 1932	1933	1932	1931	P.C. of 1932	1933	1932	1931
South—								
Virginia	108	66,625	61,504	93,077	108	190,644	175,839	172,380
North Carolina	138	432,781	314,419	356,827	134	771,657	575,843	894,642
South Carolina†	123	199,212	161,500	166,495	121	487,887	402,698	523,964
Georgia‡	125	173,458	138,766	148,904	121	421,856	348,798	663,571
Florida†	131	21,092	16,060	29,796	91	126,606	139,377	184,564
Alabama	133	131,550	98,850	166,150	121	240,300	198,100	405,150
Mississippi	108	38,400	35,500	72,470	92	73,395	79,400	183,895
Tennessee†	147	27,940	19,068	51,176	122	49,433	40,394	94,857
Arkansas‡	186	9,960	5,350	26,525	123	18,435	14,950	58,321
Louisiana†	142	11,090	7,800	12,065	108	34,107	31,654	72,588
Texas	91	5,855	6,400	5,960	91	26,007	28,618	56,482
Oklahoma	49	100	205	165	67	1,925	2,875	6,724
Totals, South	129	1,118,063	865,422	1,129,610	120	2,442,253	2,038,543	3,417,138
Midwest—								
Indiana	50	6,109	12,281	42,040	65	22,322	34,418	101,430
Illinois	201	3,188	1,585	7,502	72	6,449	8,911	20,273
Kentucky	136	14,188	10,440	38,798	80	34,137	42,795	86,835
Missouri	46	1,399	3,035	3,621	44	6,088	13,895	25,565
Kansas	113	135	120	83	22	307	1,385	1,400
Totals, Midwest	91	25,019	27,461	92,044	68	69,303	101,404	235,503
Grand totals	128	1,143,082	892,883	1,221,654	117	2,511,555	2,139,950	3,652,641

*Monthly records of fertilizer tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States.

†Cottonseed meal sold as fertilizer included.

‡Excludes 19,210 tons of cottonseed meal for January-March combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

¶Georgia April sales incompletd, estimate based on shipments.

SOLVENT NEWS

JUNE ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1933

SOLVENT OUTPUT INCREASED WITH CONSUMPTION EXPANDING

Taking production figures for industrial alcohol and methanol as representative of the solvent industry, the output of solvents in the first quarter of this year was held in check sufficiently not only to prevent stock accumulations but even to make some inroads upon producers' holdings. In the case of denatured alcohol, production for the first quarter represents a decline of more than 15 per cent compared with the corresponding period of 1932. While crude methanol registered a small gain over last year—the total output for crude and synthetic declined more than 24 per cent from the 1932 quarter.

From March to date, various solvent consuming industries have become more active and have taken on larger supplies of raw materials. This has encouraged some expansion in solvent production.

Distribution of many solvents in May and June to date was on a larger scale than at any previous time this year and the position of the principal consuming industries points to large withdrawals for the immediate future.

IMPROVED TURBIDITY INSTRUMENT

The turbidimeter shown offers a simple accurate method of measuring turbidity, allowing the readings to be taken directly, with but a very small sample which is placed directly into the instrument itself without the necessity of preparation.

It is based on the disappearance of an illuminated target against a field of much lower intensity, brought about by adding to the density of the sample to be read, a second density, obtained from a variable neutral wedge. Repositioning of the target making it darker or brighter than the adaptation field is a decided advantage. The method offered is standard and repeatable.

DETERMINATION OF PLASTICIZERS BY A NEW METHOD

The identification and separation of plasticizers under the old precipitation system is both time consuming and costly.

The following method is suggested in a recent edition of the Analytical Edition of Industrial and Engineering Chemistry: The plastic material is cut into small strips and placed in a 2-liter distilling flask equipped with a thermometer. The flask is immersed in an oil bath and connected by the side arm to a 500 cc. receiving flask which is cooled by immersion in a freezing mixture. A vacuum of 0.1 mm. of mercury is applied to the system and the oil bath heated rapidly. At a temperature of 250° to 260° C. a complete separation may be accomplished within a few hours.

* * *

Precision glass tubing, having an inside diameter accurate to ±.001 mm. (1/25000 inch) in short lengths and ±.01 mm. (1/2500 inch) in longer lengths, is now available for use in manometers, viscosimeters, valves, pumps, etc. It is manufactured from glass having a minimum coefficient of expansion.

MODERN SOLVENT SPECIFICATIONS BENEFIT BOTH BUYER AND SELLER

Practice Generally Employed in Testing Present Day Solvents Briefly Described

The appraisal and definition of lacquer solvents have, within the last year or so, approached the standing of a fine science. Buyers, armed with the precise determinations of their laboratories, are drawing specifications so closely as virtually to compel the suppliers to furnish solvents of a purity and uniformity heretofore unknown. Every physical and chemical behavior factor is carefully studied and translated into rigid tests to which the purchased solvent must fully conform.

As an illustration of the scope of the modern specification, a nitrocellulose solvent may be examined for the following:

STANDARD TESTS	NEWER TESTS
Acidity	Blush Resistance
Boiling range	Corrosion
Color	Dilution Ratio
Dryness	Evaporation Rate
Non-volatile Matter	Flash Point
Odor	ReducingSubstances
Purity (Ester Value)	Viscosity
Specific Gravity	Water Solubility

Most solvent suppliers have recognized and fallen in line with this trend to closer and more detailed specifications—and have standardized their goods on an extremely high-quality level.

A majority of solvent buyers are acquainted with and employing the conventional tests for the usual constants of acidity, specific gravity, etc., but there are in the group above, tests which are relatively new, and of practical and economic significance. In the descriptions following, the standard tests will be omitted and space devoted to the newer tests.

Blush Resistance: With the ever present urge to use the most economically priced solvents which will properly function in the finished product, buyers should necessarily pay close attention to the important property of blush resistance. As is doubtless well known, such low-boiling liquids as acetone, methanol, and methyl acetate are excellent solvents for nitrocellulose and resins, in the lower priced bracket but are not practical for the usual lacquer because of their quick evaporation and marked tendency to blush.

(*Continued on Page Two*)

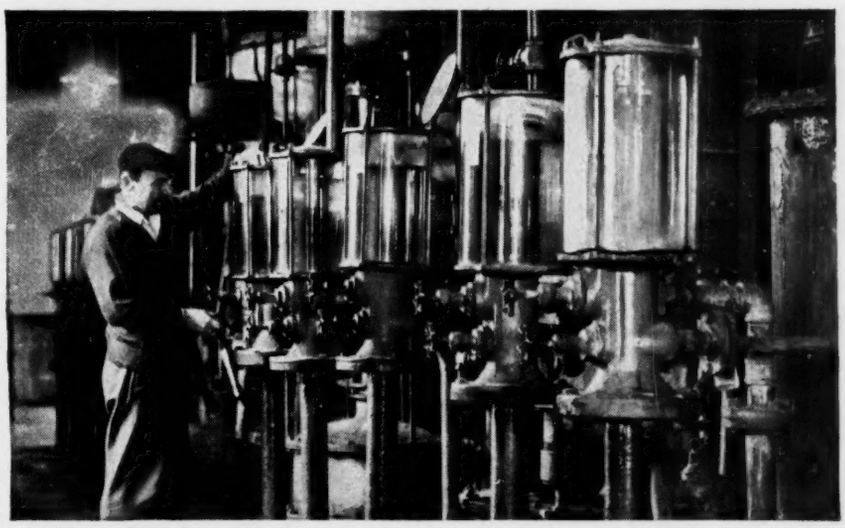
Alcohol News

The tremendous interest created during the past year by SOLVENT NEWS has led the U. S. Industrial Alcohol Co. to introduce a new and additional service in the form of ALCOHOL NEWS, a clearing house of news and developments in the industrial alcohol field directed primarily to the Drug, Pharmaceutical and Cosmetic Industries. ALCOHOL NEWS will appear as a regular monthly bulletin in rotogravure form, as a brown and cream insert in the following trade journals: Oil, Paint and Drug Reporter; American Perfumer; Drug Trade News; and Drug and Cosmetic Industry.

"Prevention of Gas in Pigmented Nitrocellulose Lacquers," occurring in isolated cases, is the subject of a recent research report. It states that this is due to the presence of organic alkalis in pigments such as bone pitch, oil black and nigrosine, causing decomposition of the nitrocellulose. Where the lacquer formulation requires the use of alkaline pigments, the remedy is found in the addition of a small amount of a suitable acid such as citric. * * *

Hard yet highly elastic lacquers have been made from a resin produced under a new German patent by the condensation of castor oil with phthalic acid or its anhydride.

This and similar resins produced with various polybasic acids and other oils containing hydroxyl groups are said to impart to lacquers the properties of hardness, elasticity and excellent adhesion.



A BATTERY OF TAIL BOXES affording instant visual inspection of ester solvents. Many of these units have built-in testing instruments. Carefully designed and modern equipment coupled with constant watchfulness and laboratory control, all contribute to the high standards of quality and uniformity of U. S. I. products.

JUNE ★ **SOLVENT NEWS** ★ 1933

SOLVENT SPECIFICATIONS

(*Continued from Page One*)

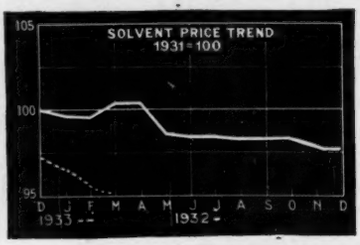
In the higher boiling classification, there is a large group of solvents and blends, offered at various prices and on differing specifications. Buyers will naturally wish to take advantage of all savings possible but only if the selected solvent will do everything that is commercially required. This means that the chosen item must be carefully examined for all desirable factors which should include a determination of its blush resistance.

Corrosion: Manufacturers of lacquers for application to bright metal work must have solvents of a low corrosion or staining factor—and specifications have been written up covering this qualification.

Dilution Ratio: Active solvents are appraised by the extent of dilution a nitrocellulose solution will stand without showing turbidity or jelling. This test is essentially a measure of solvent power—the stronger the solvent, the more dilution it will endure, which information has distinct value in the economic choice of lacquer components. The conventional testing diluents are commercial toluol (2°), and petroleum hydrocarbon with a boiling range of not less than 80°C. and not over 150°C.

Evaporation Rate: The older school of solvent users classified solvents according to their boiling ranges—and while, in a general way, evaporation rate parallels boiling range, this is not uniformly so. As solvents in a lacquer do not evaporate at their boiling point, evaporation rate is really the important factor—and the evaporation test is very often employed in a determination of this characteristic—not only for single solvents but for solvent mixtures.

Flash Point: This test as a rule more concerns the producer than the user, particularly as shipments must conform to I. C. C. rulings as to type of container, cautionary labels, etc. However, information as to flash point is often helpful in planning fire protection and insurance rates. Solvent specifications should properly include this determination.



SOLVENT PRICE TREND

The firmer trend of prices in general has spread to the solvents' list and a better undertone has marked trading in the majority of selections. On the other hand, lower prices established some weeks ago prevailed over the last month and these declines in sales schedules aided in bringing down the index number to 92.53 in comparison with 94.34 for the preceding month.

Reducing Substance: A few solvents such as acetone, pure alcohol and acetic ether are submitted to special tests for purity, i.e. the absence of carbonizable or reducing substances. These tests are used where the items are intended for some particular medical, food or chemical employment and have no significance for the routine solvent buyer.

Viscosity Test: It is well known that the choice of solvents affects the viscosity or flowing property of finished lacquer products. Viscosity is also considered a corollary of solvent power, i.e. as a rule the most active solvents yield solutions of lowest viscosities when tested under standard conditions.

Water solubility (Solubility of Water in Solvents): This test is considered of importance as an indication of the behavior of solvents under humid conditions which, in turn, have a bearing on the blushing characteristics of the finished lacquer.

A brief and comprehensive outline of the Newer Tests, giving apparatus used and method of procedure will be supplied gratis, on request.

TECHNICAL DEVELOPMENTS

A grey anti-corrosion pigment has been made from bauxite. The pigment is first treated in a reducing atmosphere to convert the iron oxide content into a stable, grey ferrous oxide, as ordinary oxides of this metal are red or yellow in color. It is said to have very good properties especially in linseed oil or varnish media.

* * *

An invisible paint which, under ultra-violet light, becomes fluorescent and changes color has been developed for commercial uses. It is particularly suited to theatre decorations and window display, is non-poisonous and easily removable.

* * *

A new water-soluble solvent cleaner has been developed which not only dissolves grease and tar but then emulsifies it, making possible its easy removal by water. This is an improvement over the ordinary grease and tar cleaners which evaporate quickly, redepositing the dirt on the article.

* * *

A new rubber-lined valve for corrosive and abrasive liquids has just been developed. It is stated that in addition to handling fluids under fairly high pressure conditions and pulsating pressure, it may be used for vacuum and throttling work.

* * *

A dull finish for oil varnishes has been developed by the addition of a new ingredient, stated to be an aluminum salt of certain Albertols. The latter are produced by the condensation of phenol-formaldehyde resins with colophony.

* * *

Two clear lacquers, having special qualities for the prevention of spotting and staining of non-ferrous and plated metals, are now being marketed.

One, when coated on non-ferrous metals, is said to stand outside exposure for a year or more without discoloration or loss of its protective quality to the metal. When applied to plated articles, this lacquer will inhibit the action of cyanide spotting caused by the minute residue deposited by the plating solution.

The other clear lacquer will completely prevent sulphur tarnishing on copper, silver or brass.

* * *

A quick-drying paint for traffic-zone marking, which is non-bleeding over asphalt, has been developed. It may also be used on walls after plaster patching to permit the application of a final coat of wall paint within forty minutes.

New Carboy Cradle

This cradle is a safe and convenient way of handling carboys containing dangerous liquids. One man can easily handle a carboy which might require three men to handle without the cradle. It is so constructed that the last drop may be poured from the carboy into a container fourteen inches tall.

Production Trends in Major Solvent-Consuming Industries

(*Moving 12-month averages,* 1931 = 100)

	April	*March*	*January-April* *1933*	*1932*
CHEMICALS: index of production (1931 = 100)	80.1	82.3	85.0	90.4
EXPLOSIVES: 1000 lb	16,005	15,804	65,594	70,135
LEATHER: index of production (1931 = 100)	97.9	92.5	95.2	96.8
LEATHER, ARTIFICIAL: pyroxylin spread, 1000 lb.	2,894	2,333	9,722	9,156
PAINT, VARNISH, and LACQUER: sales ($1000)	———	$14,365	$38,657	$51,254*
TEXTILE (Cotton) FINISHING: 1000 yd	74,463	95,746	352,282	310,666

*Figures for January-March only.

The Financial Markets

On The Way Up

The first real bull market in nearly four years developed in May. The improvement in values which first started at a very modest pace early in April suddenly assumed much greater proportions last month and prices advanced sharply. The movement was characterized by only a few appreciable hesitant moments; here and there in the list temporary weaknesses occurred and at the close of the third week a slight faltering was apparent, but fresh news of an encouraging nature forced the general level up to a new high for the year.

Daily Record of Stock Market Trend

N. Y. Herald Tribune

Trading volume expanded and the market ceased to have the appearance of being exclusively a professional one. The general public, stimulated and encouraged, was active for the first time in many months. Wall Street is again smiling. About the only weakness in evidence occurred in the oil stocks. The chaotic condition brought about by uncontrolled production made such issues relatively unattractive. Appreciation in May, however, did not reach the total registered in April although trading was along a much wider front and general interest being greater the market took on a real bullish tone. It was the first time in five years though that stocks had advanced in May.

The enhancement in values of 240 stocks in 20 groups on the N. Y. Stock Exchange was $3,065,367,525, or 20%. This followed their gain of $4,244,262,095, or 39% in April. The combined appreciation for the two months was $7,486,801,823, or 67% of the valuation of those stocks at the end of February. The recovery has canceled all the losses sustained in the market since the end of November, 1931, according to this compilation.

Reasons For Rise

Continued gains in business activity, definite steps to expand credit conditions by the Federal Reserve and the effects, psychologically, of the measures undertaken by the government to raise prices generally influenced market sentiment considerably last month. The advance was not so abrupt as in the previous month, and was subject to more reaction than in April. However, with each sagging tendency a new market factor entered, either in the form of foreign news or news from Washington, or some favorable business report, and turned the trend of the market upward again.

The following table shows the changes in the 20 groups of the *N. Y. Times* compilation:

	May 1933	
Group and Number of Issues	*Avr. Net Ch'ge in Points*	*Change in Values*
Amusements (5)	+ 1,875	+ $16,696,448
Building equipment (9)	+ 5,847	+ 73,095,070
Business equipment (4)	+ 4,375	+ 38,050,038
Chain stores (14)	+ 2,295	+ 66,606,182
Chemicals (9)	**+ 7,861**	**+ 335,593,591**
Coppers (15)	+ 3,616	+ 150,512,367
Depart. stores (10)	+ 5,687	+ 44,245,298
Foods (19)	+ 3,164	+ 128,183,933
Leathers (4)	+ 6,625	+ 7,587,222
Mail order (3)	+ 3.125	+ 30,705,169
Motors (15)	+ 2.142	+ 248,014,494
Motor equipment (7)	+ 4.357	+ 25,144,101
Oils (22)	+ 3.506	+ 389,037,807
Public utilities (29)	+ 5.379	+ 743,751,086
Railroads (25)	+ 9.015	+ 497,682,190
Railroad equipment (8)	+ 5.219	+ 59,773,822
Rubber (6)	+ 3.146	+ 21,752,855
Steels (13)	+ 5.154	+ 91,119,157
Sugars (9)	+ 2.555	+ 23,557,725
Tobaccos (14)	+ 4.187	+ 74,258,970
Average and total 240 issues	+ 4.666	+ $3,065,367,525

Chemical Stocks Soar

It is interesting to note that as in April the chemical stocks again showed very heavy appreciation. The average gain for the chemical stocks in May was only exceeded by that for the railroads. The net appreciation for the nine stocks comprising the chemical group amounted to $335,593,391. This was somewhat under the figure for April when the total reached $403,188,208. Outstanding in the gains of the month were the 22¼ points registered by du Pont and the 17¼ points gain by U. S. I.

	Advances
Allied Chemical	$21,611,592
Commercial Solvents	2,214,027
Du Pont de Nemours	246,211,491
Mathieson Alkali Works	3,902,616
Texas Gulf Sulphur	9,525,000
Union Carbide & Carbon	43,827,951
U. S. Industrial Alcohol	6,448,843
Virginia Carolina Chem.	721,644
Westvaco Chlorine Prod.	1,130,427
Total	$335,593,391

The net changes from January through May, 1933 have been as follows:

	Increases	*Declines*
January	$39,652,757	.....
February	.....	168,411,582
March	24,037,138	.....
April	403,188,208	.....
May	385,593,391	.....

Prices have gone lower in only one month of this year. The net appreciation to date for this year in the chemical group amounts to $634,159,918 and more than counter-balances the net decline of $368,177,263 for 1932. Chemical prices are back at 1931 levels.

Temporary Set Back

Trading in the chemical group was again featured by temporary weaknesses in Allied common and preferred as news of the controversy between the management and the Listing Committee of the Stock Exchange was released and again when an independent stockholders' committee, headed by C. W. Nichols, announced that it would demand that wider representation of the stockholders on the Board of Directors be effected by the addition of two new directors selected by the interests not allied with the present management. However, the losses were only temporary and the common moved ahead with the rest of the list on each successive wave of higher prices.

Allied's Financial Reports

Allied Chemical management's controversy with the N. Y. Stock Exchange (CHEMICAL MARKETS, May, p. 449) over the type and amount of information given in the company's annual financial report became more acute in the past month. After two postponements a meeting of the company representatives with the officials of the Stock Exchange failed to bring the groups in accord. In a final attempt to force the company officials to change its policy of reporting the Exchange through its president, Richard Whitney, issued an ultimatum, threatening to remove both the common and preferred shares from the list on August 23 unless the terms of the Exchange were met. Mr. Whitney's

Market value of all chemical stocks on N. Y. Stock Exchange, June 1, was $3,052,434,289 against $2,444,271,453 on May 1. Average price rose from $35.20 to $43.93 in the 30-day period.

Price Trend of Chemical Company Stocks

	Apr. 29	*May 6*	*May 13*	*May 20*	*May 27*	*Net Change*
Allied	87½	93½	97⅛	101¾	104¼	+16¾
Air Reduction	61	69	70½	72	77½	+16½
Anaconda	11⅜	12¾	13⅛	12⅞	13⅜	+ 2
Columbian Carbon	35½	48½	54¾	52	52	+16½
Commercial Solvents	16⅝	16⅝	16⅞	16¼	18¾	+ 2⅛
DuPont	48¾	57½	64⅛	62¼	71⅜	+22⅝
Mathieson	20¼	23½	23½	24½	26⅞	+ 6⅝
Monsanto	37½	42½	42¾	42	47½	+10
Std. N. J.	33¾	34⅝	35⅜	34¾	34⅜	+ ⅝
Texas Gulf	24	26	26	25⅞	27½	+ 3½
U. S. I.	27¼	27⅜	29⅛	30¾	47¼	+20

statement was as follows: "Notwithstanding prolonged negotiations with Allied Chemical and Dye Corporation, no agreement has been reached in regard to the information to be furnished presently to

Stock Exchange Head—Richard C. Whitney delivers ultimatum to Allied Management

stockholders or in regard to the future publication of the balance sheet, surplus and income account of this corporation in a manner which, in the opinion of the committee on stock list, would furnish stockholders with information essential to a proper understanding of the condition of the corporation and of its operations.

"Accordingly, the committee on stock list recommends to the governing committee that the preferred and common stock of Allied Chemical and Dye Corporation be stricken from the list of the New York Stock Exchange on Aug. 23, 1933, unless prior thereto the corporation shall have furnished stockholders with adequate information in regard to the present condition of the company and shall have entered into an agreement with the exchange, satisfactory to the committee on stock list, as to the manner in which the financial reports of the corporation will be published in the future.

"The above recommendation of the committee on stock list was adopted by the governing committee."

Holds Own Stock

Revelation that Allied holds among its current assets large amounts of its own preferred and common stocks and had disclosed neither the fact of such holdings nor the fact that "other marketable securities" held are largely the company's own securities was made known in a letter from Mr. Whitney to the company in explanation of the Exchanges' ultimatum. In his letter he stated that there is no justification for the procedure unless the facts are fully disclosed and "that under the existing conditions, there is no justification for including such holdings under current assets. His letter also revealed that at a secret meeting between officials of the company and officials of the Exchange the management of the former had agreed to make certain changes in the method of reporting financial statements as follows: Property account carried at cost, marketable securities carried at cost, basis of inventory value, separation of United States Governments from other marketable securities, amount of other marketable securities listed on the Stock Exchange or Curb, market value of United States Governments, market value of other marketable securities, amount of reserve for depreciation of marketable securities, the statement that the item of "further surplus" consists of a specified amount of earnings accrued to the company since its organization and a specified amount of earnings accrued to its constituent companies since the company's organization, amounts of the company's preferred and common stocks held in the Treasury at cost, and the reserves provided, if any, to cover the difference between cost and market; any substantial amount of non-recurring income included in income, and whether dividends paid on the company's holdings of its own stock are included in income.

Atherton Defends Policy

Reiterating the statement that publication of information concerning the company's financial affairs would probably be utilized by the company's competitors, a lengthy letter from H. F. Atherton, secretary of Allied, dated May 24, maintains that the company had fairly complied with the Exchange's requests for information of March 28, 1933. Referring to publication of the original report of the Exchange Stock Committee of April 26, which alleged further attempts to secure information were unavailing, Mr. Atherton's letter says that "by its sudden publication without warning of this unwarranted special report, the Exchange apparently sought to transform what had previously been a reasonable exchange of views between it and the company regarding possible voluntary changes by the company in the form of its annual reports, into a campaign by the Exchange to compel the company to make such changes unwillingly by means of hostile and misleading public propaganda.

"This action by the Exchange," the letter states, "raises fundamental questions regarding the relationship between it and the companies whose securities it has admitted to trading."

Mr. Atherton's letter in part continues:

"We have assured you informally of the baselessness of the unfavorable gossip regarding the company which has recently spread abroad. This has concerned principally the company's marketable securities. We wish now to confirm the facts in this regard as previously stated to the stock listing committee. It has been suggested that by reason of these security holdings the company was more of an investment trust than a chemical manufacturer. The fact is, as the company's published balance sheet shows, that these securities constitute less than a quarter of its assets. It has been rumored that, although the balance sheet describes the item as "U. S. Government and Other Marketable Securities," no substantial amount of U. S. government securities are included.

"The fact is that about $20,000,000 of U. S. government securities are included. It has been rumored that the balance of the item represents a speculative trading account, largely affecting the company's earnings. The fact is that it consists practically entirely of the securities of six companies. Of these holdings the chief are substantial holdings of the company's preferred and common stock. The others are in the main holdings in other companies which are related to this company's operations, and for this reason we consider that it would be contrary to the best interests of our stockholders to publish the list of these holdings. All these securities have been held for years; there have been no sales of any of them at any time, except that in 1931 the company decreased its holdings in one other company by less than 20% and in another by less than 15%. None of these securities are current assets in the sense that the company contemplates cashing them in the near future, but only in the sense they are in fact readily marketable. The company has never speculated in the security markets and never will under the present management."

Stockholders Form Committee

On June 2 a still further angle was added to the question when announcement was made of the formation of a stockholder's

Orlando F. Weber, president of Allied issued on June 7 following statement to stockholders:

"Your attention may have been called to an advertisement recently published in certain newspapers by a Committee purporting to act on behalf of stockholders and seeking to obtain representation on your Board of Directors.

"The management of your Company, which you have retained in office since the Company was incorporated, proposes at an early date to issue a statement of the utmost importance to stockholders. We respectfully request that meanwhile you refrain from forming any conclusion or taking any action based on the committee's representations."

Table shows how widely distributed is the stock of 13 leading chemical companies or companies closely allied to chemical industry. Despite depression number of stockholders has increased in each case from 1929 to 1932.

	1932	1931	1930	1929
Amer. Smelt. & Ref.	16,941	16,974	15,594	11,759
Atlantic Refining	29,350	28,100	24,900	19,000
Commercial Solvents	27,323	22,446	15,600	8,621
Corn Products Ref.	12,000	10,675	9,200	8,000
Du Pont	50,778	42,465	34,643	25,470
Eastman Kodak	38,755	36,088	33,274	31,000
Int'l Nickel	98,557	94,621	76,235	54,241
Standard Oil Calif.	72,352	69,391	62,175	57,300
Standard Oil Indiana	101,886	99,426	90,851	81,022
Standard Oil of N. J.	141,419	127,046	111,956	92,758
Texas Corp.	89,716	85,082	74,970	65,898
Texas Gulf Sulphur	26,801	25,414	22,485	17,300
Union Carbide & Carb.	53,439	49,369	38,404	28,780

committee under the chairmanship of C. W. Nichols. In paid advertisements the committee attacked the policy of the management and requested stockholders to fill out forms calling for a special meeting of the stockholders to take place on August 10. The Committee states that its purpose is not to force the election of an entirely new board of directors but to obtain the election of three or four directors in sympathy with the demand of the Exchange that such information as they request will be given and the ultimatum removal withdrawn.

The committee has apparently been formed says the *Wall Street Journal* "at the instance of the two largest groups of stockholders in the company formerly represented on the board of directors and who have had no such representation in the last two years. C. W. Nichols, representing the Nichols family, founders of General Chemical is believed to represent about 300,000 shares.

"The Solvay group of Belgium, who controls approximately 500,000 shares of the Solvay American Investment Corp., are represented by Gordon Auchincloss, and F. M. Weld of White, Weld & Co. Other members of the committee are E. Roland Harriman, G. M. P. Murphy and J. C. Traphagen.

New Monsanto Chemical Co.

N. Y. Stock Exchange has authorized listing of 429,000 shares of common stock, par $10 each, on official notice of issuance and delivery to stockholders of Monsanto Chemical Works (Missouri), share for share upon surrender and cancellation of their Monsanto Chemical Works stock.

Company was organized in Delaware on April 19, 1933. The authorized capital stock consists of 500,000 shares of common stock, par $10 each, of which 429,000 shares are to be issued and outstanding.

By resolution of the directors adopted April 25, 1933, 429,000 shares of common stock were authorized to be issued in connection with the acquisition of the business and assets and the assumption of the obligations and liabilities (except capital stock obligations) of Monsanto Chemical Works of Missouri. The 429,000 shares are to be issued share for share to the stockholders of Monsanto Chemical Works upon surrender and cancellation of the 429,000 outstanding shares of stock.

N. Y. Stock Exchange has authorized listing of 858,204 shares of Tennessee Corp. stock (par $5) in substitution for a like number of shares of stock without par value previously listed and now outstanding.

N. Y. Stock Exchange announced May 25 that it had stricken from its list International Combustion Engineering common and 7% cumulative convertible preferred shares and certificates of deposit for latter issue. Company's principal assets were acquired recently by the Superheater Corp. International Combustion has been in receivership since December 1929. N. Y. Produce Exchange announced May 25 that it had admitted preferred shares and certificates to its securities market.

Dividends and Dates

Name	Div.	Stock Record	Payable
Abbott Labs.	$ .50	June 15	July 1
Amer. Home Prods.	.25	June 14	July 1
Archer-Daniels	.25	May 20	June 1
Armour & Co. Del. pf	$1.75	June 10	July 1
Chlorox Chemical	.50	June 20	July 1
Columbian Carbon	.50	May 15	June 1
Com'l Solvents	.30	June 2	June 30
Compressed Ind. Gases	.35	May 31	June 15
Devoe & Reynolds, 1st pf	$1.75	June 20	July 1
Devoe & Reynolds, 2nd, pf.	$1.75	June 20	July 1
Drug Inc.	.75	May 15	June 1
duPont	.50	May 25	June 15
du Pont, deb.	$1.50	July 10	July 25
Eastman Kodak	.75	June 5	July 1
Eastman Kodak, pf.	$1.50	June 5	July 1
Freeport Texas	.50	May 15	June 1
Hazel Atlas Glass	.75	June 17	July 1
Hazel Atlas ext.	.25	June 17	July 1
Heyden Chemical	.25	May 22	June 1
Heyden Chemical, pf	$1.75	June 20	July 1
Intern'l Salt	.37½	June 15	July 1
Lehn & Fink	.50	May 15	June 1
Mathieson Alkali	.37½	June 12	July 1
Mathieson Alkali, pf.	$1.75	June 12	July 1
Monsanto Chemical	.31¼	June 10	July 1
Nat. Dist. Prod., pf.	.62½	June 10	July 1
Nat. Lead	$1.25	June 16	June 30
Nat. Lead B. pf.	$1.50	July 21	Aug. 1
Owens-Ill. Glass, pf.	$1.50	June 15	July 1
Patterson Sargent	.12½	May 15	June 1
Penick-Ford	.25	June 1	June 15
Pittsburg Plate Glass	.15	June 10	July 1
Procter & Gamble 5% pf.	$1.25	May 25	June 15
Sherwin-Williams, pf A	$1.50	May 15	June 1
Spencer Kellogg	.15	June 15	June 30
Texas Gulf Sulfur	.25	June 1	June 15
Westavaco Chlorine	.10	May 25	June 1

N. Y. Curb has removed from dealings Will & Baumer Candle common stock, no par value; preferred stock, par value $100, because of inactivity.

McKesson & Robbins, Inc., stockholders at an adjourned meeting held on May 9 approved an amendment to the charter eliminating operating deficit of $4,889,263 existing as of Dec. 31, 1932 by a transfer to capital surplus.

N. Y. Curb Exchange has removed from unlisted trading privileges Hooker Electrochemical, capital stock, par value $100.

General Refractories Applies

General Refractories Co. has made application to N. Y. Stock Exchange to list 294,000 additional shares of its capital stock of no par value. Of the new stock, 240,000 shares are for the exercise of stock purchase warrants attached to its new issue of $6,000,000 five-year 6% first mortgage bonds, and 54,000 shares are for compensation for deferred payment of interest on these bonds. This new stock would bring the authorized listing of the company to 594,000 shares.

Application has also been made for the listing of voting trust certificates for the said 594,000 shares of stock, to be used on notice of the issuance from time to time upon the deposit of a like number of shares under a voting trust agreement provided for in the recent refinancing plan.

N. Y. Curb has announced removal of United Molasses, Ltd., from the list of the Guaranty Trust Co. of New York American depositary receipts for 6% preference shares, par value £1.

A quarterly dividend of 10c. per share has been declared on Westavco Chlorine common stock, no par value, payable June 1 to holders of record May 15. A quarterly distribution of 25c. per share was made on this issue on June 1, 1932; none since. Prior to the latter date, company paid dividends of 40c. per share on March 1, 1932 and on Dec. 1, 1931 and 50c. per share in preceding quarters.

There was called for redemption on May 22, $28,000 of 10-year 5½% sinking fund gold debentures, due March 1, 1931, at 101½ and interest. Payment will be made at the Guaranty Trust Co., 140 Broadway, N. Y. City, or at the Continental Illinois National Bank & Trust Co., Chicago.

Capital Administration (investment trust) shows following changes in chemical and allied industries' common stocks in its portfolio.

	Mar. 31 1933	Dec. 31 1932	Inc. (+) or Dec. (—)
Air Reduction	1,000	1,500	—500
Commercial Solv.	3,600	3,000	+600
Corn Products	....	500	—500
Drug	2,500	1,300	+1,200
duPont	....	500	—500
Eastman Kodak	600	750	—150
Int'l Nickel	5,000	7,000	—2,000
Texas Gulf	300	800	—500
Union Carb.	....	500	—500

Incorporated investors, another trust, shows following cases:

	Dec. 31 1932	Mar. 31 1933	Inc. (+) or Dec. (—)
Air Reduction	12,500	12,500	....
Allied Chemical	5,000	5,000	....
Commercial Solv.	....	10,000	+10,000
Corn Products	15,000	15,000	....
Drug, Inc.	12,000	12,000	....
duPont	15,000	15,000	....
Monsanto Chem.	4,000	4,500	+500
Union Carb.	25,000	25,000	....
U. S. Gypsum	10,000	10,000	....

Over the Counter Prices

	April 30		May 27	
J. T. Baker	..	..	..	..
Dixon	20	30	30	37½
Merck, pfd	80	85	90	95
Worcester Salt	40	50	..	..
Young, J. S., pfd.	77	82	80	..
Young, J. S., com.	36	50	48	..

Foreign Markets

	April 30	May 27
London		
British Celanese	7s 9d	13s 3d
Celanese	53s 9d	£7 5/8
Courtaulds	£1¾	£1¾
Distillers	53s 7½d	58s 3d
Imperial Chemical	24s 4½d	26s 7½d
Un. Molasses	5s	8s 3d
Paris		
Kuhlmann	530	1020*
L'Air Liquide	760	610*
Berlin		
I. G. Farben	149	129
Milan		
Italgas	12¾	11¾
Montecatini	104½	108¼
Snia Viscosa	177	177

*May 26

Earnings at a Glance

Company	Annual Dividends	Net Income 1933	Net Income 1932	Common Share Earnings 1933	Common Share Earnings 1932
Amer. Com'l Alcohol: March 31 quarter	f....	76,711	107,790	.39	.55
Amer. Zinc, Lead & Smelt.: March 31 quarter	f....	†24,089	†15,906	...	...
Barnsdall Corp.: March 31 quarter	f....	†852,803	†390,125	...	...
Certain-teed Products: March 31 quarter	f....	†631,506	†511,937	...	...
Columbian Carbon Co.: March 31 quarter	2.00	242,333	277,954	.45	.51
Continental-Diamond Fibre: March 31 quarter	f....	†138,454	†162,374	...	...
Glidden Co.: Six months, April 30	f....	30,210	73,274	p.46	q.89
Liquid Carbonic: Twelve months, Mar. 31	f....	†682,287	896,099	...	2.61
Monsanto Chemical Works: March 31 quarter	1.25	296,920	275,859	h.69	h.64
Nat'l Distillers Products: March 31 quarter	f....	‡219,210	‡223,473	...	...
New Jersey Zinc Co.: March 31 quarter	2.00	437,378	591,104	.22	.30
		1932	1931	1932	1931
Associated Rayon Corp.: Year, December 31	f....	†$96,404	$108,531	...	...

fNo common dividends; †Net loss; pOn preferred stock; hOn shares outstanding at close of respective periods; ‡Profit before federal taxes.

American I. G. Reports $1,245,621 Profit

American I. G. Chemical for year ended March 31, 1933 (certified by independent auditors), shows net income of $1,245,621 after federal taxes, interest, etc., equivalent under the participating provisions of the shares, to $1.58 a share on 486,207 no-par shares of Class A common stock and 16c a share on 3,000,000 no-par shares of Class B common stock. This compares with net income in preceding fiscal year after deducting $256,145 net loss on sale of securities of $1,718,397, equal to $2.18 a share on Class A and 22c a share on Class B stocks.

Investments and other marketable securities are carried in balance sheet, as of March 31, 1933, at cost or market which ever is lower. The write-down on investments, to the extent that market quotations were available, and on other marketable securities amounted to $6,677,587, of which $5,000,000 was charged against reserve account created for that purpose on March 31, 1932, and the balance of $1,677,587 was charged against capital surplus.

Balance sheet, as of March 31, 1933, shows total assets of $63,748,245, comparing with $69,788,809 on March 31, 1932. Capital surplus was $6,684,434 and earned surplus $7,375,413 a total of $14,059,848, against total surplus of $14,491,813. Current assets, including $16,377,146 cash and marketable securities at cost or market, whichever lower, amounted to $17,682,401 and current liabilities were $744,222. This compares with cash and marketable securities at cost or market, whichever lower, of $15,263,525, current assets of $17,161,564 and current liabilities of $1,352,821 at end of preceding year.

Income account for year ended March 31, 1933, compares as follows:

	1933	1932	1931
Income	$3,107,344	*$3,624,961	$4,252,987
Expenses	161,220	155,010	159,350
Fed tax & other deduct	70,327	105,459	124,572
Interest	1,630,176	1,646,095	1,646,113
Net income	$1,245,621	$1,718,397	$2,322,952

*After deducting $256,145 net loss on sale of securities.

United Chemicals, and subsidiaries report for quarter ended March 31, 1933, net loss of $45,503 after depreciation, taxes and charges, comparing with net profit of $31,360 in first quarter of 1932. Current assets as of April 1, 1933, were $1,206,077 and current liabilities were $71,652.

Columbian Carbon and subsidiaries' preliminary report for quarter ended March 31, shows net income of $242,333, after depreciation, depletion and federal taxes, equivalent to 45c a share on 538,420 shares of no-par stock. This compares with $277,954, or 51c a share, in first quarter of 1932.

Liquid Carbonic Shows Net Loss in Year

Liquid Carbonic reports for 12 months ended March 31, 1933, net loss of $682,287 after charges, depreciation and taxes. This compares with net profit in 12 months ended March 31, 1932, of $896,099, equal to $2.61 a share on 342,406 no-par shares of capital stock. Consolidated income account for 12 months ended March 31, compares as follows:

	1933	1932	1931
Net sales	$6,001,488	$8,756,814	$12,001,581
Loss after expense, etc	78,271	*1,674,071	*2,042,885
Interest	11,773	26,971	75,531
Depreciation	591,612	625,527	622,472
Federal taxes, etc	631	125,474	163,994
Net loss	$682,287	*$896,099	*$1,180,888

*Profit.

International Nickel and subsidiaries for quarter ended March 31, shows net loss of $80,158 after depreciation, depletion, interest and federal taxes. This compares with net profit of $536,072, equivalent after dividend requirements on 7% preferred stock, to less than 1c a share on 14,584,025 no-par shares of common stock in first quarter of 1932. Sales have improved appreciably during first six weeks of second quarter compared with the first three months of 1933. Consolidated income account for quarter ended March 31, compares as follows:

	1933	1932	1931	1930
Earnings	$1,098,632	$1,764,955	$3,238,406	$6,619,806
Other income	7,744	2,712	15,975	297,133
Total inc	$1,106,376	$1,767,667	$3,254,381	$6,916,939
Expenses	224,615	276,461	374,494	447,271
Federal tax	57,355	65,372	145,910	582,958
Depr. depl. etc	815,671	803,931	954,476	1,144,788
Interest	88,893	85,831	119,864	125,778
Net loss	$80,158	†$536,072	†$1,659,637	†$4,616,144
Pfd. divs	483,474	483,485	483,484	483,475
Com. divs	.....	.....	2,186,792	3,438,877
Deficit	$563,632	*$52,587	$1,010,639	*$693,792

*Surplus. †Profit.

American Commercial Alcohol and subsidiaries report for quarter ended March 31, net profit of $76,771 after charges, depreciation and taxes, equivalent to 39c a share (par $20) on 194,747 shares of capital stock. This compares with $107,790 which based on same number of shares is equal to 55c a share in first quarter of 1932.

New Jersey Zinc reports for quarter ended March 31, net income of $437,378 after taxes, depreciation, depletion, contingencies, etc., equivalent to 22c a share (par $25) on 1,963,264 shares of stock. This compares with $591,104, or 30c a share in first quarter of 1932. Income account for quarter ended March 31, compares as follows:

	1933	1932	1931	1930
*Net income	$437,378	$591,104	$860,769	$1,671,867
Dividends	981,632	981,632	981,632	981,632
Deficit	$544,254	$390,528	$120,863	†$690235

*Includes dividends received from subsidiaries and after taxes, depreciation, depletion, contingencies, etc. †Surplus.

Vulcan Detinning reports for quarter ended March 31, net profit of $17,082 after depreciation, taxes, inventory adjustments, etc., equivalent to $1.09 a share on 15,638 shares of 7% preferred stock. This compares with net profit in first quarter of 1932, of $30,039, equal after dividend requirements on 7% preferred stock, to 4c a share on 32,258 shares of common stock. Income account for quarter ended March 31, compares as follows:

	1933	1932	1931	1930
Sales	$249,600	$688,920	$982,991	$1,538,370
Inv. adj	†35,393	†114,208	*25,007	†173,529
Exp. depr. etc	202,675	540,806	914,417	1,230,935
Profit	$11,532	$33,906	$93,581	$33,906
Other income	8,566	3,605	6,560	5,192
Total income	$20,098	$37,511	$100,141	$139,098
Tax res. etc	3,016	7,472	20,877	28,653
Net profit	$17,082	$30,039	$79,264	$110,445
Dividends	27,541	44,906	66,748	.....
Deficit	$10,459	$14,867	‡$12,516	.....

*Credit. †Debit. ‡Surplus.

The Industry's Securities

1933 May Last	1933 High	1933 Low	1932 High	1932 Low	Sales In May	Sales During 1933	Stocks	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	Earnings $-per share-$ 1930
NEW YORK STOCK EXCHANGE													
78¾	79⅞	64⅛	79⅛†	47½	63½	30⅞	114,500	344,000	Air Reduction	No	841,288	$3.00	4.54	6.32
101½	109½	88½	109½†	70½	88½	42⅜	429,900	1,486,500	Allied Chem. & Dye	No	2,401,000	6.00	6.74	9.77
118	119½	115	121⅞	115	120†	96½	4,200	14,000	7% cum. pfd.	100	393,000	7.00		
16¾	17⅞	14½	17⅞†	7¼	15½	3½	32,200	83,400	Amer. Agric. Chem.	100	333,000	Yr. Je. '30		Nil
29	30½	19¾	30½†	13	27	11	269,100	378,900	Amer. Com. Alc. (new)	20	375,000			d1.27
19½	21⅛	17⅝	21⅛†	9½	15½	7	13,700	27,800	Archer Dan. Midland	No	550,000	1.00	Yr. Aug. 30	1.68
20¾	20¾	15	20¾†	9	25½	7*	28,000	47,400	Atlas Powder Co.	No	261,438		.59	2.67
70	70	65	70†	60	79½	45½	530	1,884	6% cum. pfd.	100	96,000	6.00		
54½	56⅞	38	56⅞†	23½	41⅞	13½	253,200	497,100	Columbian Carbon	No	538,420	2.00	3.02	5.04
18⅜	19½	16⅛	19½†	9	13¾	3½	503,400	1,464,800	Comm. Solvents	No	2,530,000	.60	.83	1.07
72⅞	74¾	69⅛	74¾†	45¾	55⅞	24¾	200,500	662,200	Corn Products	25	2,530,000	3.00	3.54	4.82
131	133	127½	145½	117½	140	99½	1,320	3,990	7% cum. pfd.	100	250,000	7.00		
71⅜	71¾	49½	71⅜†	32½	59½	22	1,024,500	2,390,700	DuPont de Nemours	20	11,008,512	2.00	4.29	4.67
104⅜	104½	99¼	106	97⅜	105⅛	80¾	8,300	25,500	6% cum. deb.	100	1,098,831	6.00		
75½	75¾	63	75¾†	46	87⅞	35½	114,100	324,818	Eastman Kodak	No	2,261,000	3.00	5.78	8.84
116½	117	111	130	110	125	99	590	940	6% cum. pfd.	100	62,000	6.00		
34	35½	28⅜	35½†	16½	28⅜	10	130,400	313,000	Freeport Texas Co.	No	730,000	2.00	3.26	w4.77
31	32½	23	32½†	15	29½	13⅞	58,900	91,200	Hercules Powder Co.	No	606,234	1.50	1.04	2.61
97	97	91½	97†	85	95	70½	370	2,120	7% cum. pfd.	100	114,241	7.00		
2⅝	3	1½	3⅞†	⅞	3½	½	23,300	36,700	Intern. Agric.	No	450,000	Yr. Je.'30		1.68
12½	15¾	9	15¾†	5	15	3½	3,800	5,400	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30	14.58
13⅝	15	13¼	15	6¾	12½	3½	910,037	2,310,737	Intern. Nickel	No	14,584,000		.22	.67
13½	14	11	14†	7½	11	8	6,500	11,400	Kellogg (Spencer)	No	598,000	.60		h1.14
34½	36¾	18¼	36¾†	10¼	22	9	193,800	311,000	Liquid Carbonic Corp.	No	342,000		2.96	5.22
27⅝	28	21	28†	14	20⅞	9	95,300	173,400	Mathieson Alkali	No	650,426	1.50	1.88	2.96
105	105	105	105	100½	105	89¾	30	240	7% cum. pfd.	100	24,610	7.00		
47½	49¾	39	49¾†	25	30¾	13⅜	30,600	75,666	Monsanto Chem.	10	429,000	1.25	2.98	1.73
70	70	30½	70†	16⅞	27½	13	438,000	614,300	National Dist. Prod. cts. (new)	No	252,000		—	1.23
108	108	89	108†	43½	92	45	6,200	16,100	National Lead	100	310,000	5.00		7.58
112	112	103½	112†	101	125	87	1,100	3,555	7% cum. "A" pfd.	100	244,000	7.00		
95	95	90	95†	75	105	61	700	1,830	6% cum. "B" pfd.	100	103,000	6.00		
4	4⅜	2⅛	4⅜†	1⅛	4⅜	1	30,100	42,600	Tenn. Corporation	5	858,204	1.00		1.21
27	28⅜	24⅜	28⅜†	15½	26⅜	12	201,500	528,200	Texas Gulf Sulphur	No	2,540,000	2.00	3.52	5.50
37⅛	39	32	39†	19¾	36⅜	15½	375,600	1,142,900	Union Carbide & Carb.	No	9,001,000	1.20	2.00	3.12
21½	23	16½	23†	10½	18	6⅜	169,100	283,600	United Carbon Co.	No	398,000		—	1.43
48	48	24¾	48†	13½	36½	13½	290,900	525,900	U. S. Ind. Alc. Co.	No	373,846		—	z2.96
19½	21⅛	16⅜	21⅛†	7⅜	23⅜	5½	173,800	330,100	Vanadium Corp. of Amer.	No	378,367			2.95
2⅜	3⅞	1¼	3⅞†	⅜	2⅜	⅜	55,200	71,300	Virginia Caro. Chem.	No	487,000	Yr. Je. '30		Nil
12	14⅜	6½	14⅜†	3¾	11½	3½	20,300	30,400	6% cum. part. pfd.	100	213,000		Yr. Je. '30	2.63
50	54	40	54†	35⅜	69½	20	2,020	6,020	7% cum. prior pfd.	100	145,000		Yr. Je. '30	11.96
14¼	15¼	10	15¼†	5	12⅜	1	23,200	34,000	Westvaco Chlorine Prod.	No		1.00	1.79	2.51
NEW YORK CURB														
8⅛	9	7½	9†	3¼	8½	1⅜	115,900	356,300	Amer. Cyanamid "B"	No	2,404,000		.21	
...	2⅜	1½	2⅜†	1	2⅜	¾	7,400	8,500	Brit. Celanese Am. Rcts.	2.43	2,806,000			
91½	92	47	92†	27	55	8	10,625	15,215	Celanese 7% cum. part. 1st pfd.	100	148,000	7.00		
78½	78½	67	78½†	51	64¼	17	3,550	4,995	" 7% cum. prior pfd.	100	115,000	7.00		
10	10	2⅜	10†	2	5⅜	1⅛	12,800	13,400	Celluloid Corp.	No	195,000			
6⅜	7	5¼	38½†	20	6⅜	4½	2,800	4,400	Courtaulds, Ltd.	1£				
54	55	39½	55†	30	39	21½	8,000	10,500	Dow Chemical	No	630,000	2.00		3.44
2	2½	¾	2½†	⅜	1½	½	7,700	8,900	Duval Texas Sulphur	No	500,000			
12	12	10½	12†	8	...	...	800	2,100	Heyden Chemical Corp.	10	150,000	1.00		
4⅞	4⅞	4⅜	4¼	4⅞	2⅞	2½	500	500	Imperial Chem. Ind.	1£			1.21	
...	13	10	13†	8	20¾	6¼	6,700	15,900	Shawinigan W. & P.	No	2,178,000	1.00		
CLEVELAND STOCK EXCHANGE														
22	22½	22	22½	22	25	21¾	[illegible]	329	Cleve-Cliffs Iron $5 pfd.	No	498,000	5.00	—	11.42
52	55	39	55†	30	40	21½	4,54[illegible]	[illegible]	Dow Chemical Co.	No	630,000	2.00		3.44
97	97	96	98	96	...	...	63	103	Dow Chemical Co., pfd.	100	3,000,000	7.00		
122	122	120	122½	110	...	...	756	1,053	National Carbon, pfd.	100	5,600,000	7.00		
PHILADELPHIA STOCK EXCHANGE														
45	45	40	45†	25¼	40	19⅞	225	1,885	Pennsylvania Salt	50	150,000	3.00	Yr. Je. '30	7.97

1933 May Last	1933 High	1933 Low	1932 High	1932 Low	Sales In May	Sales During 1933	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE											
...	90	83½	90†	70½	80	62	26	204	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
78	78½	72	83½	64	80	54½	304	1,389	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
9⅞	10½	3⅝	10½†	2¼	18	1	254	390	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
...	65	50½	65†	37	60	34½	96	223	By-Products Coke Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
102½	102½	101⅜	104½	101	104⅞	100⅜	82	246	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822,000
57¼	57¼	40	57⅛†	38½	54⅝	32	83	177	Int. Agric. Corp. 1st coll. tr. stamped to 1942	1942	5½		
10¼	9¼	4¾	10½	2½	15½	½	799	1,563	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
...	96½	94½	98½	87¼	97½	67	97	349	Montecatini Min. & Agric. deb 7s with warrants	1937	7	J. J.	8,188,000
45	45½	39½	62	38	59	17	47	210	Ruhr chemical s. f. 6s	1948	6	A. O.	3,578,000
...	97	91½	97	87	90	66	166	415	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
...	68	57	68†	50	66	39	33	168	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
62½	62½	47¼	62½†	34¾	75	30	330	894	Vanadium Corp. conv. 5s	1941	5	A. O.	5,000,000
NEW YORK CURB													
61¼	62½	58	65	49	76	55	288,000	1,720,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
61½	64	57	64	50	76	55	202,000	881,000	4½s., series "B"	1968	4½	M. N.	16,108,000
101½	101½	101	103½	101	103½	99	29,000	65,000	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

h 11 mos. ending Aug. 30 w 13 mos.; Before inventory adjustment; *New Low; †New High

Chemical Exports and Imports

U. S. Chemical Export Figures for March

ARTICLES	MARCH 1933		THREE MONTHS ENDING MARCH 1933	
	Quantity	*Dollars*	*Quantity*	*Dollars*
COAL-TAR PRODUCTS		1,492,988		3,432,696
Benzol gal.	497,115	109,871	1,356,234	274,313
Crude coal tar bbl.	59,184	138,933	119,259	279,486
Coal-tar pitch tons.	39,095	543,466	88,964	1,176,227
Creosote oil gal.	21,111	4,088	30,286	5,826
Coal-tar colors, dyes, stains, and color lakes lb.	2,150,960	408,646	4,897,567	1,082,854
Other coal-tar products, exclusive of medicinals lb.	2,218,580	287,984	7,972,939	613,990
INDUSTRIAL CHEMICAL SPECIALTIES		929,363		2,218,145
Nicotine sulphate (40% basis) lb.	13,704	6,963	36,573	19,165
Lead arsenate lb.	701	72	44,104	2,943
Calcium arsenate lb.	66,860	2,461	395,886	16,211
Other agricultural insecticides, fungicides, and similar preparations and materials lb.	245,636	24,393	888,651	92,418
Household insecticides and exterminators:				
Liquid lb.	441,555	132,405	721,592	217,208
Powdered or paste lb.	39,843	10,742	102,616	21,675
Household disinfectants, deodorants, germicides, and similar preparations lb.	209,208	16,070	410,880	33,877
Baking powder lb.	268,514	59,124	655,294	144,035
Petroleum jelly lb.	1,079,121	62,040	2,598,125	155,770
Tobacco extracts lb.	124,178	18,934	368,398	56,652
Dextrine or British gum lb.	758,889	24,848	3,336,328	106,240
Rubber compounding agents (accelerators, retarders, etc) lb.	121,953	61,617	356,833	179,271
Cementing preparations, for repairing, sealing, and adhesive use lb.	287,638	35,698	619,632	81,628
Textile specialty compounds lb.	177,110	16,555	1,659,024	52,464
Water softeners, purifiers, boiler, and feed-water compounds lb.	121,401	12,905	298,877	43,292
Metal-working compounds lb.	40,881	5,423	108,957	14,780
Specialty cleaning and washing compounds (exclusive of soap) lb.	• 93,199	9,889	299,668	29,084
Polishes:				
Metal and stove polishes lb.	73,095	10,876	170,451	25,129
Shoe polishes and shoe cleaners lb.	87,684	22,262	217,694	58,200
Leather dressings and stains lb.	218,771	30,939	767,138	86,241
Floor wax, wood, and furniture polishes lb.	57,915	10,376	161,314	30,665
Automobile polishes lb.	37,770	7,883	127,134	23,179
Other chemical specialty compounds, n.e.s.		346,888		728,018
INDUSTRIAL CHEMICALS		1,192,573		3,426,034
Acids and anhydrides:				
Organic (exclusive of coal-tar acids) lb.	43,685	6,010	108,960	14,516
Inorganic:				
Hydrochloric (muriatic) lb.	503,719	7,870	1,781,196	24,392
Boric (boracic) lb.	199,130	8,464	901,308	37,989
Other inorganic acids and anhydrides lb.	983,919	33,529	2,434,904	88,508
Alcohols:				
Methanol gal.	233,754	102,649	408,489	174,152
Butanol (butyl alcohol) lb.	169,586	13,453	563,179	44,550
Other alcohols lb.	194,409	16,795	322,220	29,166
Acetone lb.	353,788	23,850	775,325	51,494
Carbon bisulphide lb.	156,638	9,075	542,811	26,422
Formaldehyde (formalin) lb.	413,854	17,424	1,201,477	52,132
Citrate of lime lb.	685,104	44,002	1,956,238	125,965
Other organic chemicals lb.	441,382	78,019	1,573,744	240,888
Nitro or acetocellulose solutions, collodion, etc lb.	40,375	9,977	604,314	98,338
Aluminum sulphate lb.	3,996,809	41,418	9,436,053	96,047
Other aluminum compounds lb.	26,552	1,430	221,470	19,053
Calcium carbide lb.	420,485	14,487	694,935	24,489
Calcium chloride lb.	410,204	4,255	1,106,028	13,016
Copper sulphate (blue vitriol) lb.	128,519	3,805	519,914	13,727
Hydrogen peroxide (or dioxide) lb.	75,303	13,425	138,909	24,879
Potassium compounds (not fertilizers) lb.	184,999	19,955	447,450	47,528
Sodium compounds lb.	28,557,917	484,576	91,400,896	1,551,146
Bichromate and chromate lb.	552,729	25,801	1,582,471	78,794
Cyanide lb.	63,597	8,629	116,650	16,050
Borate (borax) lb.	12,164,598	160,670	42,990,496	556,090
Silicate (water glass) lb.	3,491,401	24,761	9,348,213	69,305
Soda ash lb.	2,208,436	40,374	5,225,889	92,600
Sal soda lb.	463,302	6,834	964,210	14,798
Bicarbonate (acid soda or baking soda) lb.	1,086,366	17,760	3,681,708	60,538
Hydroxide (caustic soda) in drums lb.	7,182,443	150,285	23,600,703	499,883
Sodium phosphate (mono, di, or tri) lb.	312,578	7,975	1,047,255	29,525
Other sodium compounds lb.	1,032,467	41,487	2,843,301	133,563
Tin compounds lb.	8,658	2,215	17,148	4,411

ARTICLES	MARCH 1933		THREE MONTHS ENDING MARCH 1933	
GROUP 8—Continued				
INDUSTRIAL CHEMICALS—Continued.				
Gases, compressed, liquefied, and solidified:	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Ammonia, anhydrous lb.	79,827	10,468	241,387	33,133
Chlorine lb.	739,593	16,486	2,445,974	53,045
Other gases, n.e.s lb.	530,161	37,599	932,837	74,943
Other industrial chemicals		171,337		462,105
PIGMENTS, PAINTS, AND VARNISHES		793,337		2,256,855
Mineral-earth pigments:				
Ocher, umber, sienna, and other forms of iron oxide for paints lb.	504,427	9,442	1,312,102	24,195
Other mineral-earth pigments (whiting, barytes, etc.) lb.	331,664	4,259	943,270	10,684
Chemical pigments:				
Zinc oxide lb	112,304	7,984	265,480	23,533
Lithopone lb	185,565	8,299	454,673	20,059
Bone black and lampblack lb	55,861	4,726	202,647	13,127
Carbon black or gas black lb.	9,168,435	340,353	28,476,794	1,061,842
Red lead lb.	136,553	6,562	290,884	15,515
Litharge lb.	228,884	10,323	649,225	26,840
White lead:				
Dry lb.	140,226	5,588	241,433	9,946
In oil lb	46,860	3,536	116,755	8,554
Other chemical pigments lb.	576,934	66,690	1,289,120	160,046
Bituminous paints, liquid and plastic		18,065		44,316
Paste paint lb	107,674	18,395	313,146	48,081
Kalosmine or cold-water paints, dry lb.	225,220	11,441	761,783	39,882
Nitrocellulose (pyroxylin) lacquers:				
Pigmented gal	21,803	52,802	68,551	164,362
Clear gal	3,565	7,193	12,855	25,428
Thinners for nitrocellulose lacquers gal	25,421	21,862	63,668	57,677
Ready-mixed paints, stains, and enamels gal	99,262	165,288	237,317	421,894
Varnishes (oil or spirit, and liquid dryers) gal.	23,271	30,529	66,890	80,874
FERTILIZERS AND FERTILIZER MATERIALS tons	85,481	623,052	201,548	1,577,000
Nitrogenous fertilizer materials:				
Ammonium sulphate tons	25	732	722	17,261
Other nitrogenous chemical materials tons	8,779	193,887	23,735	527,377
Nitrogenous organic waste materials tons	681	11,056	1,693	24,857
Phosphatic fertilizer materials:				
Phosphate rock:				
High-grade hard rock tons	2,917	18,744	7,445	50,721
Land pebble tons	70,078	294,243	157,804	632,866
Superphosphate tons	81	742	1,949	20,070
Other phosphate materials tons	89	6,564	248	15,336
Potassic fertilizer materials tons	1,928	68,546	5,248	201,630
Nitrogenous phosphatic types (concentrated chemical fertilizers) tons	848	26,695	2,554	82,292
Prepared fertilizer mixtures tons	55	1,843	150	4,590
EXPLOSIVES, FUSES, ETC		162,303		351,403
Explosives:				
Smokeless powder lb.	5,552	2,970	19,027	10,329
Dynamite lb.	973,550	122,200	1,715,050	219,041
Other explosives lb.	74,528	8,836	125,297	17,008
Fuses and blasting caps:				
Safety fuses lin. ft.	3,202,000	15,054	12,317,085	58,482
Blasting caps no.	746,260	13,243	3,117,335	46,543
SOAP AND TOILET PREPARATIONS		510,600		1,256,700
Soap:				
Medicated lb.	30,314	15,212	79,239	46,083
Toilet or fancy lb.	476,050	60,092	1,199,190	146,652
Laundry lb.	2,050,369	100,030	4,426,888	195,559
Powdered or flaked lb.	99,831	9,906	201,005	18,396
Shaving creams lb.	22,445	9,502	48,142	21,830
Shaving cakes, powders, and sticks lb.	42,313	11,366	72,843	21,475
Other soap lb.	95,330	7,219	175,472	17,329
Scouring soaps, bricks, pastes, and powders lb.	351,733	28,238	752,008	60,312
Household washing powders lb.	43,230	2,209	169,298	10,735
Dental creams lb.	96,024	82,721	289,042	229,551
Other dentifrices lb.	6,325	10,168	78,631	26,888
Toilet powders:				
Talcum powder, in packages		27,842		86,661
Face powder		13,638		32,222
Compact		4,003		9,089
Creams, rouges, and other cosmetics:				
Cold creams lb.	35,322	17,471	76,213	38,584
Vanishing creams lb.	19,062	6,643	44,137	14,307
Other creams, lotions, and balms		16,302		47,829
Rouges		5,690		13,722
Lip sticks		16,108		28,177
Other cosmetics		5,677		16,035

Compiled from Monthly Summary of Foreign Trade of the United States, of the Dept. of Commerce

U. S. Chemical Import Figures for March

ARTICLES	MARCH 1933		THREE MONTHS ENDING MARCH 1933	
GROUP 8	*Quantity*	*Dollars*	*Quantity*	*Dollars*
COAL-TAR PRODUCTS		909,273		2,170,418
Dead or creosote oil, free gal.	4,546,182	348,981	5,692,452	440,937
All other crudes, free		48,705		164,934
Acids, dut lb.	108,407	7,723	132,278	13,857
All other intermediates, dut lb.	123,846	87,701	289,568	191,260
Colors, dyes, stains, color acids, and color bases, n.e.s., dut lb.	314,204	391,230	1,096,679	1,290,715
Coal-tar medicinals, dut lb.	1,643	7,098	5,588	23,374
Other finished products, dut lb.	6,491	17,835	16,113	45,341
MEDICINAL AND PHARMACEUTICAL PREPARATIONS		367,771		1,089,186
Quinine sulphate, free oz.	189,127	66,432	701,543	242,551
Other quinine and alkaloids, and salts from cinchona bark, free oz.	123,600	52,357	502,700	213,482
Other alkaloids, salts and derivatives, dut		11,173		21,649
Antitoxins, serums, vaccines, etc., and blistering beetles, free		29		552
Menthol, dut lb.	38,658	74,219	101,544	194,843
Santonin and salts, free lb.	309	17,507	353	19,982
Other medicinals, dut		28,590		82,867
Preparations in capsules, pills, tablets, etc., dut		65,367		162,243
Other preparations, n.e.s., dut		52,097		151,017
INDUSTRIAL CHEMICALS		826,464		2,608,968
Acetylene, butylene, ethylene, and propylene derivatives, dut lb.	93,349	6,836	223,607	21,309
Acids and anhydrides:				
Acetic or pyroligneous, dut lb.	1,032,070	53,730	4,550,830	274,518
Arsenious (white arsenic), free lb.	2,256,694	47,687	6,069,163	125,753
Formic, dut lb.			43,975	2,576
Oxalic, dut lb.	5,743	299	31,944	1,655
Sulphuric (oil of vitriol), free lb.	64,375	658	239,848	1,997
Tartaric, dut lb.			174,606	24,957
All other free lb.	10,345	474	34,794	953
All other dut lb.	144,592	20,099	353,863	46,090
Alcohols, including fusel oil, dut		1,344		2,186
Ammonium compounds, n.e.s.:				
Chloride (muriate), dut lb.	444,606	11,096	1,193,350	29,268
Nitrate, dut lb.	710,696	16,225	1,570,189	32,176
All other, dut lb.	50,417	3,619	126,206	8,374
Barium compounds, dut lb.	187,484	7,390	541,484	19,526
Calcium compounds, dut lb.			139,207	1,810
Cellulose products, n.e.s.:				
Acetate, dut lb.	441	409	641	550
All other:				
Sheets, more than 3/1000 inch thick, and other forms, dut lb.	7,849	6,258	22,096	28,048
Sheets and strips more than 1 inch wide, not over 3/1000 inch thick, dut lb.	953	197	4,491	1,555
Cobalt oxide, dut lb.	36,821	30,143	69,377	57,154
Copper sulphate, dut gross weight lb.				
Copper sulphate, dut copper content lb.				
Glycerin, crude, dut lb.	329,515	11,812	1,438,906	48,226
Glycerin, refined, dut lb.	320,561	18,147	809,889	46,265
Iodine, crude, free lb.			500	1,046
Lime, chlorinated, or bleaching powder, dut lb.	141,261	3,942	330,819	6,690
Magnesium compounds, dut lb.	767,005	10,422	2,773,414	35,613
Potassium compounds, n.e.s.:				
Carbonate, dut lb.	758,396	30,148	2,900,050	115,981
Chlorate and perchlorate, dut lb.	705,340	26,999	2,479,891	93,467
Cream of tartar, dut lb.				
Cyanide, free lb.			17,361	6,035
Hydroxide (caustic), dut lb.	406,857	23,042	1,245,711	66,567
Argols, tartar, and wine lees, free lb.	1,119,452	60,633	2,809,770	153,255
All other, n.e.s., dut lb.	326,010	16,249	641,818	36,225
Sodium compounds, n.e.s.:				
Sulphate (salt cake), free tons.	7,172	73,512	18,229	194,540
Sulphate, anhydrous, dut tons.	1,164	18,933	1,922	33,135
Chlorate, dut lb.			133,510	5,089
Cyanide, free lb.	877,840	92,914	2,882,540	263,139
Ferrocyanide (yellow prussiate), dut lb.	44,753	3,358	190,307	15,690
Nitrite, dut lb.				
Phosphate (except pyrophosphate), dut lb.	192	23	7,182	516
Other sodium compounds, n.e.s. free lb.	66,477	928	110,575	1,584
Other sodium compounds, n.e.s. dut		35,560		99,294
Radium salts, free grains.	1	2,978	37	118,971
Other industrial chemicals free		49,901		233,957
Other industrial chemicals dut		140,499		353,228
PIGMENTS, PAINTS, AND VARNISHES		103,895		326,795
Mineral earth pigments:				
Iron oxide and iron hydroxide, dut lb.	1,136,761	16,545	2,231,809	35,310
Ochers and siennas, dut lb.	426,548	5,361	1,500,990	19,841
Other mineral earth pigments, dut		1,681		53,580
PIGMENTS, PAINTS, AND VARNISHES—Continued				
Chemical pigments:	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Lithopone and zinc pigments, n.e.s., dut lb.	224,000	6,022	1,727,069	48,563
Zinc oxide and leaded zinc oxide, dut lb.	553,086	23,825	1,497,252	65,065
Other chemical pigments, dut lb.	150,442	12,183	269,227	24,109
Paints, stains, and enamels, dut		35,296		76,001
Varnishes, dut gal.	820	2,982	1,170	4,326
FERTILIZERS AND MATERIALS tons.	96,054	1,866,740	277,831	5,257,042
Nitrogenous:				
Ammonium sulphate, free tons.	41,208	655,651	122,476	1,950,231
Ammonium sulphate-nitrate, free ton.				
Calcium cyanamide, or lime nitrogen, free tons.	10,566	230,880	25,321	578,644
Calcium nitrate, free tons.	2,900	49,386	8,517	144,825
Guano, free tons.	763	18,893	7,135	160,801
Dried blood, free tons.	154	4,058	513	12,350
Sodium nitrate, free tons.	106	3,534	3,027	84,112
Urea and calurea, free tons.	1,018	85,317	1,935	154,843
Other nitrogenous, free tons.	3,367	56,760	9,111	154,795
Phosphates:				
Bone ash, dust, and meal, and animal carbon fertilizers, free tons.	3,416	57,687	8,252	141,024
Other phosphates, free tons.	2,398	28,692	8,057	88,690
Potash fertilizers:				
Chloride, crude, free tons.	6,086	225,770	17,648	645,270
Kainite, free tons.	3,912	31,581	13,733	121,534
Manure salts, free tons.	7,222	77,621	22,818	246,500
Sulphate, crude, free tons.	3,462	156,703	7,674	328,148
Nitrate, crude (saltpeter), free tons.	1,182	61,270	2,672	141,515
Other potash-bearing substances, free tons.	21	135	206	4,291
Fertilizer compounds, containing nitrogen, phosphoric acid, and potash, free tons.	143	7,974	1,111	51,478
All other, free tons.	8,130	114,828	17,625	247,991
EXPLOSIVES		32,668		40,344
Powder and other explosives, n.e.s. free lb.				
Powder and other explosives, n.e.s. dut		316		3,087
Firecrackers, dut lb.	260,195	29,938	293,567	33,050
Fireworks and ammunition, dut		2,414		4,207
SOAP AND TOILET PREPARATIONS		121,142		347,678
Soap:				
Castile, dut lb.	150,080	11,682	415,953	31,806
Toilet, dut lb.	57,906	10,715	135,886	33,560
All other, dut lb.	116,817	8,079	307,246	22,233
Perfume materials free lb.	303	14,044	1,379	48,203
Perfume materials dut		40,370		112,436
Perfumery, bay rum, and toilet water, dut		22,791		48,394

Export and Import Statistics

Total amount of domestic merchandise exports in March amounted to $106,309,776 compared with a total value of general imports of merchandise of $94,864,133. March exports and imports expanded in March over February figures which were $99,438,088 and $83,803,193 respectively. Exports in the chemicals and related groups amounted to $6,617,285 and imports $4,230,276. The figures for February were $5,108,644 and $3,921,916 respectively. For the three months ending March the figures stand at $17,014,718 and $11,851,768 respectively, showing a wide difference in favor of export.

A comparison for the past four months is given:

	Dec., 1932	*Jan., 1933*	*Feb., 1933*	*March, 1933*
Total exports	$129,056,731	$118,600,168	$99,438,088	$106,309,776
Total imports	97,058,870	95,993,705	83,803,193	94,864,133
Chemicals, exports	6,169,970	5,286,170	5,108,644	6,617,285
Chemicals, imports	3,258,780	3,699,566	3,921,916	4,230,276

The upturn in figures for March are rather surprising in view of the unsettled conditions attending the bank moratorium and other adverse influences.

The Trend of Prices

Further Improvement

Further evidence of business betterment continues to come in from the various sections of the country. Trade, both retail and wholesale, is greatly improved. Most of the news is encouraging. A better feeling is sweeping the country as prices of commodities go to new high levels and production schedules expand at a very rapid rate. Collections are better; credit is easier.

The basic industries are more active. The swift advance in steel production continued to grow in May. This increase in activity forced better prices. The automotive industry has been experiencing a small boom and April figures of 181,029 units tops the April 1932 production of only 148,326 units. One of the most encouraging signs is the steady increase week by week of the consumption of electrical energy. Carloadings are now above the corresponding weekly figures for 1932. The textile field is exceptionally busy and rayon producers are as a rule operating at capacity. The tire and rubber factories have been forced to speed up schedules and several large Akron plants are operating on a 24 hour a day basis. Most of the major industrial fields are experiencing better conditions. The tanning, shoe and leather, glass, paint and varnish industries are speeding up production and prices have been steadily improving. Even the paper and building trades are showing some definite signs of awakening from the doldrums.

Commodity Price Rise

The advance in commodity prices initiated in April has shown no signs of lagging. Fisher's index jumped from 58.6 on April 28 to 62.1 on June 2 and the *N. Y. Journal of Commerce's* index registered a new high of 60.3 on June 4. Heeding the plea of the President that wages keep pace with price advances of manufactured goods and raw commodities, hundreds of companies throughout the country have announced wage increases to maintain the purchasing power of the masses. While it is difficult to obtain exact figures it is certain that unemployment has been reduced and thousands removed from charity lists and returned to gainful work.

For 10 consecutive weeks the *N. Y. Times* index of business activity has moved upward and is now at a higher week than at any period in 1932.

The following table gives the combined index and its component series, which are adjusted for seasonal variation and, technically, for long-time trend:

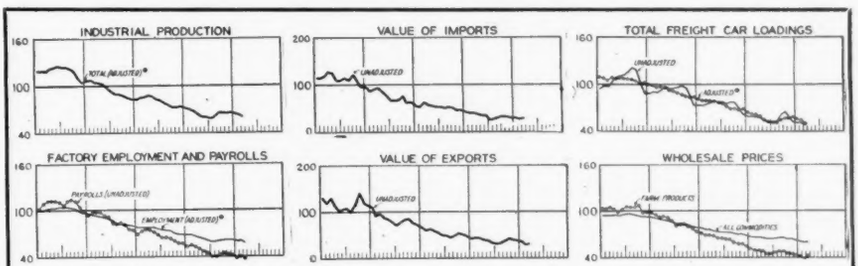
	Week Ended May 27 1933	May 20 1933	May 28 1932
Freight-car loadings	55.7	55.7	53.1
Steel-mill activity	56.1	51.3	25.4
Electric power output	88.2	87.3	84.2
Automobile production	44.4	47.1	40.6
Lumber production	48.9	46.9	38.6
Cotton forwardings	163.0	154.7	70.1
Combined index	79.0	77.5	65.9

*Cyanamid was advanced to $1.02½ as the month closed.

Indices of Business

	Latest Available Month	Previous Month	Year Ago
Automobile Production, April	189,284	125,000	154,823
–†Brokers Loans, May 24	$563	$618	$393
*Building Contracts, April	$56,573	$59,958	$121,704
–*Car Loadings, May 20	531	531	515
†Commercial Paper, April 30	$64	$71	$108
–†Elec. output, kwh., May 20	1,483	1,468	1,435
Payrolls, April	38.6	36.9	48.7
Failures, Dun, April	1,921	1,948	2,816
*Merchandise Imports, April	$88,000	$95,000	$126,522
*Merchandise Exports, April	$105,000	$108,000	$135,095
Furnaces in Blast, May 1	16.8	13.3	21.1
*Steel Orders, April 20	1,864	1,841	2,326

*000 omitted. †000,000. –Weeks, not months.



Business indicators, Department of Commerce. The weekly average 1923-25 inclusive = 100.

Chemical Tonnage Heavier

In common with most other industries the chemical field has felt the generally improved status of business. Tonnages are much better. Prices too have been advancing in the past six weeks over a broad front but it is true, nevertheless, that the upswing in chemical prices is very modest when compared with other commodities. However, with the manufacturing of chemicals largely if not entirely a mass production proposition, increases in tonnages will help considerably toward better profits.

Nearly all of the leading consuming industries have increased their demands for industrial chemicals. The tanning trade is again active in the Peabody section with the end of the strike that hampered manufacturing operations; textile finishing and dyeing plants are busy with a rush of last minute orders for summer goods. Although the fertilizer mixing season is largely over shipments of ingredients are still in encouraging volume. Sale of top-dressing materials are satisfactory. After a very poor start the paint, lacquer and varnish industries have come through with a rush and in many cases plants are operating at capacity in an endeavor to make prompt deliveries.

In April the largest number of advances were in imported items. This was but the logical reaction to the abandonment of the gold standard. In the past month several important rises in domestic items were announced. Early in May acetate of lime producers advanced quotations from $2.50 to $2.75 and this action was immediately followed by an adjustment of acetic acid prices. On the same day an unexpected advance of 20c a hundred pounds was made in disodium phosphate. The strengthening in caustic potash brought about several important price revisions in a number of potash salts. Casein's meteoric price rise continued in May. All of the metallic salts were firmer as a result of the increases in the metals. The lead pigments were again advanced, all of the tin salts were quoted at much higher levels, and even copper sulfate was raised 25c per hundred pounds. It is impossible to do more than list the outstanding advances. With such a large proportion of the industrial chemicals sold on an annual contract basis it is quite unlikely that the advances will be as numerous as in other fields. In some cases, however, spot prices have been raised, and in many quarters such increases are looked upon as indicative of the probable trend of contract prices for next year, providing, of course, that basic conditions continue to grow better.

Potash prices have not as yet been released by the foreign syndicate and it is unlikely that they will be until after the convening of the London Economic Conference. A last minute announcement was made as the month closed that domestic and foreign ammonium sulfate would be offered at $21 a ton basis ex vessel at ports*

for delivery at any time up to the end of the year.

Future prices of everything—from a needle to an anchor—depend largely upon what is done at the Economic Conference. Currency stabilization, lower tariffs, trade agreements, freer exchange of commodities are among the subjects that will be discussed and passed upon at that meeting. Upon the decisions reached there will largely rest the future world price structure of the next few years at least.

Important Price Changes

Advances	May	April
Acid acetic, 28%	2.88	2.75
Acid benzoic, tech	.40	.35
Acid stearic, single	.08	.07½
Acid tartaric	.20½	.20
Arrowroot	.08¼	.08
Arsenic, red	.10½	.10¼
Calcium acetate	2.75	2.50
Casein, dom	.09½	.08¾
Copper sulfate	3.50	3.25
Cream of Tartar, imp	.17	.16¼
English vermillion	1.20	1.19
Iodine, crude	2.50	2.30
Lead, red, dry	.07¼	.07
Litharge	.06¼	.06
Mercury	59.00	55.50
Methanol, denat. tanks	.40	.37
Nickel sulfate, single	.12	.11
Nickel sulfate, double	.12	.11
Orange mineral	.09¾	.09½
Potash caustic	.07¼	.06¼
Potash cyanide	.55	.50
Potash prussiate, red	.35	.32½
Potash prussiate, yellow	.17	.16½
Phosphorous, red	.45	.40
Phosphorous, yellow	.28	.27½
Sodium phosphate, di, bags	2.00	1.80
Sodium phosphate, di, bbls	2.20	2.00
Sodium Stannate	.29½	.19
Stearates	1c a lb. in nearly all cases	
Superphosphates	7.50	7.00
Tin crystals	.32½	.27½
Tin tetrachloride	.22	.1607

Declines		
Methyl acetone, tanks	.40	.42
Potash sulfate, 90-95%	42.15	47.50

Acetone — Producers continued to quote former price levels. Demand from consuming industries was greatly improved over April.

Acid Acetic — Past month, of course, was featured by a general rise in all grades based on the 25c advance in lime. Shipments have been very heavy, particularly for the textile and rayon industries. The basic grade, 28%, is now quoted at $2.78 in barrels, a rise of approximately 13c per 100 lbs.

Acid Benzoic — Leading producers announced a 5c advance on May 24. The new minimum price is now quoted at 40c.

Acid Chromic — With automobile production in May at a higher rate than in the same month a year ago and distinctly better than in the first quarter of 1933, shipments of acid were in greater volume. Prices were much firmer, but no announced advances were made, although the extremely low level now prevailing and the advance in the spot price of bichromate gave color to the belief that some such action might be expected.

Acid Citric — The rather unseasonal weather prevailing in most of the country delayed the usual demand for this period of the year.

Acid Formic — Steady improvement in the textile trade was reflected in greater tonnages. The price position was unchanged.

Acid Sulfuric — A much more optimistic note prevailed in this market with steel activity at 41%. Shipments for fertilizer purposes slowed up slightly as the mixing season gave signs of ending, but the total consumption was satisfactory. The Baltimore area stocks are low and prices slightly firmer on spot sales.

Acid Tartaric — The highly competitive position between the imported and domestic having been largely corrected when this country went off the gold standard, domestic producers were able to make a ½c advance in May, bringing the base price up to 20½c.

Alcohol — Some uncertainty seemed to prevail in the market over the future trend of prices. On the other hand, although producers would not make any statement, it was felt in many quarters that prices for the third three months' period would probably duplicate the existing schedule. Shipments have been much better in the past 30 day period.

Alums — Paper industry, long in the doldrums, appeared to be emerging from its lethargy. Demand for water purification was seasonally better.

Ammonia Anhydrous — Unseasonal weather is offered in explanation of a rather poor demand for this time of the year, but the advent of warm weather is expected to correct this condition.

Ammonia Aqua — Dyeing centers were quite active throughout the 30-day period and May volume was reported as quite satisfactory. There has developed in the dyeing centers a last minute rush for seasonal goods that was as welcome as it was unexpected.

Ammoniates — Dried blood, nitrogenous material, and tankage all showed exceptionally strong tendencies and although tonnages were off as the mixing season tapered off, spot stocks were in most cases scarce and held at firm prices.

Ammonuim Sulfate — Dealers report sale of spot stocks for top-dressing material as good. At the close of the month the announcement was unexpectedly made that a price of $21 a ton had been set by both domestic and foreign factors, basis ex-vessel at ports, for delivery any time up to the end of the year.

Antimony—Importers continued to quote 6¼c in the face of a rather limited number of inquiries.

Arsenic Red — The lower value of the dollar measured in foreign currencies resulted in a ½c advance, the new level being 10¾-11½c.

Benzol — The rapid advance in tire factory schedules added still another reason for firmness in this market. Advance in steel mill activity did not relieve the scarcity of stocks. Recovery of benzol was slightly higher in April, as compared with March, whereas output of tar, light oils and ammonium sulfate were slightly lower. Estimated from production of coke at by-product ovens known to recover benzol output was 3,710,495 gals. in April, as compared with 3,705,778 gal. in March and 4,389,000 gals. in same month last year. For the calendar year to May recovery amounts to 15,102,727 gals., as against 18,853,000 gals. in first four months last year. Output of tar in April amounted to 22,034,515 gals., as against 22,053,150 gals. in March and 25,056,200 gals. in April last year. For first four months production of tar totaled 89,736,008 gals., as against 107,352,040 gals. in corresponding period, 1932. Production of light oil aggregated 7,358,871 gals. in April, being compared with 7,368,363 gals. in March and 8,333,910 gals. in April last year. Output for first four months declined to 29,846,976 gals. from 35,706,220 gals. in corresponding period last year. Ammonium sulfate or its equivalent, production in April amounted to 28,106 tons, as compared with 28,257 tons in March and 31,960 tons in April last year. Total to the end of April was placed at 114,462 tons, as against 136,932 tons in the similar period last year. Production of by-product coke amounted to 1,656,183 tons, or 55,206 tons per day, as compared with a daily rate of 53,743 tons in March. Daily average pig iron production increased 18.9% during month; responding to this increased activity, daily rate of coke production at furnace, plants increased 6.9%, while the merchants plants declined 1.4%.

Butyl Alcohol — Last month was one of the best in tonnage that producers have experienced for a long time.

Calcium Acetate — With a much better statistical position of stocks to point to producers advanced quotations to $2.75.

Calcium Chloride — A particularly wet spring plus the depressed finances of many municipal and state agencies is holding down tonnages for dust-laying purposes.

Carbon Tetrachloride — Market had a much firmer appearance last month. Shipments were in greater volume.

Casein — The strong position of this item remained unchanged and producers were quoting 10-10½c on standard grade and 11-11½c on 80-100 mesh.

Chlorine — Producers report that the seasonal improvement for water purifications is taking place and that shipments into the paper industry have also expanded slightly in the past 30 day period.

Chrome Yellow — The broad advance in lead was thought in some quarters to mean possible higher prices for the pigment. Sellers have intimated that they will not take contracts for the balance of the year at the current price level.

Coal Tar — Demand was better in May than at any other period in the past year. Sellers continued to name $8 a barrel. Exports of crude coal tar products

from U. S. during first quarter of this year totaled almost $1,000,000 more than those in first quarter of 1932. Imports of these products were slightly lower in this year's quarter. Foreign trade in the several products in the two periods compared as follows:

Exports

	First Quarter 1933	
	Quantity	*Value*
Benzol	1,356,234*	$274,313
Coaltar crude	119,259†	279,486
Coaltar pitch	88,964‡	1,176,227
Cresote oil	30,286*	5,826
Total value		$1,735,852
	1932	
Benzol	448,675*	$94,307
Coaltar crude	93,288†	216,891
Coaltar pitch	50,242‡	462,906
Creosote oil	12,914*	3,118
Total value		$777,232

Imports

	First Quarter 1933	
	Quantity	*Value*
Creosote oil	5,692,452*	$440,937
Other crudes	.....	164,934
Total value		$605,871
	1932	
Creosote oil	5,472,906*	$517,646
Other crudes	.....	197,570
		$715,216

*Gallons. †Barrels. ‡Tons.

Copperas — Although steel activity rose to 41% stocks were not excessive and prices remained firm.

Copper Sulfate — When the metal reached 7½c at the turn of the month from a low of 5c, blue vitriol was advanced 25c per 100 lbs. Carlots are now quoted at $3.50. Producers report sale to date for agricultural purposes about equal to last season.

Cyanamid — Effective at once the price of cyanamid for delivery after June 30 to July, 1934 has been advanced to $1.02½ per unit of ammonia for pulverized materials in bags, carlots, delivered buyer's plant. As yet no price has been set on the newer granular material. For material bought in June for June delivery the price of 97½c is continued. Tonnages already booked ahead are encouraging in volume.

Dextrin — The stronger position in the corn market brought about a 15c advance in the various grades of dextrin early in the month. Improved conditions in business generally give a firm tone to most of the commodities and the corn market has enjoyed a sharp advance.

Ethyl Acetate — The weakness in this item was largely corrected in the past month as demand from the lacquer industry expanded. No price changes were made from the published schedule. Prices of competing solvents are likely to make any price advances difficult at the present time.

Glaubers — Silk dyeing and tanning trades were making better demands on producers and stocks were said to be lower than for sometime past. With the warm season at hand it is thought that the position of the item will be even stronger over next two or three months.

Glycerin — Soap and dynamite grades were advanced ½c very early in the month. Sellers appeared unwilling to accept long-term contracts at present levels, feeling that higher prices were inevitable. Demand was fairly good in most quarters. The Chicago market was reported firm with active trading in all grades.

Lead Acetate — While no special advance was made as in the case of the pigments, the advances in the metal were reflected in a firmer tone for all grades of acetate. With acetic higher also, it was pointed out, in some quarters, present schedule might be advanced.

Lead Pigments — Further sharp advances in the metal brought about two distinct advances in the past 30 days. On May 24 ¼c rises in red lead, litharge and orange mineral were announced. On June 1 another ¼c was added and in addition white lead and basic lead sulfate were advanced ½c, the first change in these items since Dec. 30.

Mercury — Prices for both foreign and domestic shot higher. It is felt that replacement stocks are going to be higher and for this reason dealers are very firm in their price position in stocks in this country.

Methyl Acetone — This chemical is distinctive if for no other reason than that it was one of a very few important items that was quoted lower during the past month. A 2c reduction brought tanks to 40c; drums, to 42c and l.c.l. drum shipments to 44c.

Methanol — Denaturing grade was advanced sharply in May. With stocks of all grades in greatly improved statistical position the price position is one of extreme firmness.

Naphthalene — Unseasonable weather has hurt sales to date. Crude was in better demand by dye plants.

Natural Tanning Materials — In common with most items largely imported this group experienced several price advances. A distinct improvement was reported in tanning operations both in the Peabody and mid-western centers. Price advances are listed in the Prices under the separate items.

Nickel Salts — Reflecting greatly improved conditions in plating 1c advances in both single and double salts were announced. Spot quotations are now 12c.

Petroleum Solvents — A sore spot in an otherwise improved business world has been the unbridled production of crude oil which has forced prices down again to extremely low levels. This action has affected petroleum chemicals and in the third week of the month several important price concessions were made. The eastern market exhibited a somewhat firmer price tone than in the mid-west field. A ¼c reduction was reported in lacquer diluents, petroleum thinners, rubber solvents, Stoddard Solvent. A firmer tone was in evidence in V. M. & P. naphthas. A few refiners offered material at a ¼c reduction but not all.

Phenol — The very firm position of this item remained unchanged. Call from the dyestuffs trade was better in May.

Potash — Uncertainty surrounding future prices has featured this market for the past 30 days. In most quarters it is now expected that the Syndicate prices will not be announced until after the International Economic Conference meets in London and its possibilities appraised for setting the world right side up again. In the meantime a certain amount of tonnage is being booked under the provisional arrangement on prices. In most quarters higher prices for the coming year are now looked upon as almost a certainty.

Potash Carbonate — Further upward revision brought quotations to 5¾c for 80-85% calcined, and 6c for 83-85% hydrated.

Potash Caustic — Domestic producers soon followed lead of the importers and raised quotations 1c to 7¼c minimum for solid. Demand was in specially good volume.

Potash Chlorate — In common with most of the potash salts the chlorate was advanced early in the month. The new price is based on 8½c.

Potash Prussiate Red — The competitive position existing now for several months between imported and domestic was largely removed by the decline of the value of the dollar expressed in foreign currency. As a result domestic material was advanced to 35c. Yellow was also quoted ½c higher.

Phosphorous — Red was advanced 5c to a basis of 45-55c. In some quarters a ½c advance was made bringing current quotation to 28c minimum for yellow; in others, no change was reported.

Rosin — The rising tide in business affected shipments very favorably in the past month. Price movements were somewhat eratic, the lower grades going higher and the higher ones showing net losses for the month. The reason for this is logically explained by the fact that a great deal of attention has been paid to the production of the pale grades and stocks in the higher grades are top heavy. At the close of business June 1 E Grade was only 20c below Windowglass rosin in the Savannah market.

Saltcake — With paper and glass industries more active than at any other period in months, stocks declined and the market took on a firmer tone, although no price advances were announced.

Shellac — While shipments were in rather slow volume in the last two weeks of May bleachers report large bookings for future deliveries, and plants are running close to capacity in many cases. With the primary markets firmer cost of replace-

ment is likely to maintain the firm position of the finished product, according to the consensus of opinion among the leading factors in this country.

Soda Ash — Producers report exceptionally heavy tonnage in May. Carryover for June is said to be sufficiently large to insure June tonnage equalling May.

Soda Caustic — All of the consuming industries increased tonnage demands and the month's total volume was the highest producers have experienced in months. Shipments for rayon continued to feature the market.

Sodium Bichromate — Shipments expanded rapidly in May and one producer reported tonnage to have been better than at any other time in the last three years. Spot prices were advanced and in some quarters this was largely interpreted to presage higher contract prices for 1934. The extremely competitive position in this item seems to have largely disappeared, momentarily at least, with the improvement in business. The mid-west producer was reported as increasing plant facilities.

Sodium Metasilicate — A much better call came from the laundry trade. Prices have taken on a much firmer tone.

Sodium Nitrate — Market was quiet but firm in the past 30 days. Stocks in this country have been greatly reduced and the statistical position has been improving. Demand for top-dressing was in good volume. No outstanding developments in the Chilean-Cosach situation took place during the month.

Our exports of chemical fertilizers, nitrogen compounds, exclusive of ammonium sulfate, increased to 167,000 long tons in 1932, a gain of 250 per cent. over 1931, while our imports were about 50,000 long tons. Last year's shipments were valued at $4,357,000, compared with $2,479,379 in 1931. Exports were mostly nitrate of soda, and it was the first year we had ever shipped abroad more nitrates than we exported.

Another record established was the exportation of more synthetic nitrogen than by-product nitrogen. Domestic consumption of nitrogen products in 1932 was estimated at 200,000 long tons, or half of that for the peak year 1930, but amount consumed was regarded as significant, notwithstanding reduced amount, due to sharp declines in prices for farm products.

Nitrate of soda has been imported from Chile for 100 years, but not since 1886 had our purchase been as low as in 1932. Imports for 1930 and 1931 exceeded 500,000 long tons and as recently as 1928 they exceeded 1,000,000 long tons. Countries to which we sent most of our nitrate exports, and the amounts in tons, were:

France 88,836; Spain 18,549; Canada 12,133; Japan 14,617; Italy 8,857; Denmark 4,921; Egypt 8,354; United Kingdom 4,400.

Sodium Phosphate — Very unexpectedly the di salt was advanced 20c, bringing the new level for large bag shipments to $2.00. Silk-weighting centers were exceptionally busy. A better demand for tri was also reported, but no price changes were made, although the highly competitive situation appeared to be improving. Feeling existed in certain quarters that some definite advance might be made in the near future.

Stearates — As a result of the advance in stearic acid of ½c all of the stearates were raised 1c. Palmitates and the cobalt driers were quoted at unchanged levels.

Superphosphate — A better tone was in evidence since the advance of 50c made early in the month.

Japanese superphosphate production during 1932 totaled 882,000 tons, according to preliminary statistics. This represents a gain of 23% over 1932. Increase necessitated larger importations of phosphate rock, the 1932 receipts of 534,922 tons representing a gain of 145,000 tons over the previous year.

Tin Salts — With the metal at the highest price since April, 1930, crystals, tetrachloride, oxide and sodium stannate skyrocketed in the past month. The statistical position of the metal is such as to lend support to the general opinion in the trade that prices are likely to remain firm and possibly may go higher.

Toluol — Automobile production schedules at new high levels have given this commodity a much firmer tone and stocks are said to be extremely low. Spot stocks were extremely difficult to locate.

Turpentine — While prices have advanced in response to the inflationary program of the administration compared with a year ago the net gain has been between 5 and 6c, or about 10% improvement. This is extremely modest compared to most other commodities. Part of this may be attributed to the fact that production this year is expected to run nearly 20% above last and receipts to date have been close to 15% greater than at corrresponding dates 12 months ago. Rosin prices have shown greater price advances than turpentine. Greater competition from foreign producers is also expected in the next 12 months.

Varnish Gums — Scarcity of most items even in the primary markets coupled with a better demand resulted in higher prices on a number of items. As the month closed dammars and Pontianak copals advanced from ¼ to 2c a lb.

Waxes — Largely in sympathy with the general price increases most of the waxes went to new high levels in May. The market was featured by the advances registered by Carnauba. Both montan and spermaceti were quoted at higher levels. The specially firm position of beeswax continued and stocks of bleachable South America were reported scarce and higher in price. Camphor was another strong item.

Zinc Dust — With the metal working into constantly higher levels producers of dust posted quotations of 6¾-7c as the month closed. L. C. L. lots were advanced to a range of 7¼-7½c.

Starch — The exceptional firmness in the commodity markets was reflected in all of the starch grades.

Zinc Oxide — Tonnages going to both the rubber and paint trades were larger than for any month in the past year or more. Prices were firm at unchanged levels.

Chinawood Oil — Trading in the past 30 days assumed wider proportions than in April. Buyers were more active. Sales were reported at the close of the month as high as 6c in tanks while tanks were reported closed on the Coast at 5½c-5⅝c. The trend of silver and exchange was upward during most of the month.

Cocoanut Oil — Business was not as brisk in this item as some of the other oils. Buyers seemed willing to defer major purchasing ahead. As the month closed sales of tanks on the Coast was reported closed at 3⅛c for prompt shipment.

Corn Oil — The advance in the commodity markets was reflected in better prices for both crude and refined. Offerings were light on spot and future delivery, aiding and maintaining a firm tone to trading.

Cottonseed Oil — The generally better conditions in the commodity markets caused advances in quotations. Weather and crop reports were considered favorable, and reports generally from the South stress satisfactory growing conditions.

Linseed Oil — Prices were again advanced in May. Flaxseed was stronger both in this country and in foreign countries. The general wave of higher prices in the commodity markets was thought to be largely responsible for this situation. The exceptionally rainy weather this spring in most sections of the country has counteracted somewhat the naturally better demand that would have resulted from generally improved business conditions.

Palm Oil — Additional advances were again made in May. Uncertainty over replacement, prices coupled with light offerings in the primary market, gave to the market throughout the 30-day period an appearance of strength. Buying for the account of the soap companies was said to be encouraging.

Perilla Oil — Several advances carried spot drum prices locally up to 7½c. On the Coast it was reported that a scarcity of material prevailed. In the Metropolitan area tanks were said to be unavailable.

Soybean Oil — May prices were higher than those prevailing in April. Good inquiry and an encouraging volume of sales characterized the market.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1932 Average $1.64 - Jan. 1932 $1.54 - May 1933 $1.66

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Acetaldehyde, drs lc-1 wks...lb.	.18½	.21	.18½	.21	.18½	.21
Acetaldol, 50 gal dr.....lb.	.27	.31	.27	.31	.27	.31
Acetamide.....lb.	.95	1.35	.95	.35	.95	1.35
Acetanilid, tech, 150 lb bbl...lb.	....	.26	...	.26	.20	.26
Acetic Anhydride, 92-95%, 100 lb cbys.....lb.	.21	.25	.21	.25	.21	.25
Acetin, tech drums.....lb.	.30	.32	.30	.32	.30	.32
Acetone, tanks.....lb.	.08	.08½	.08	.10	...	.10
Acetone Oil, bbls NY.....gal..	1.15	1.25	1.15	1.25	1.15	1.25
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68
Acetylene Tetrachloride (see tetrachlorethane).....						
Acids						
Acid Abietic.....	....	.06	.06	.12	.12	.12
Acetic, 28% 400 lb bbls c-1 wks .....100 lb.	2.78	3.03	2.65	3.03	2.40	2.75
Glacial, bbl c-1 wk....100 lb.	....	9.58	9.14	9.58	8.35	9.14
Glacial, tanks.....	....	8.89	...	8.89	8.10	8.89
Adipic.....	.72	.72	.72	.72	.72	.72
Anthranilic, refd, bbls.....lb.	.85	.95	.85	.95	.85	.95
Technical, bbls.....lb.	.65	.70	.65	.70	.65	.70
Battery, cbys.....100 lb.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.35	.45	.35	.45
Boric, powd, 250 lb. bbls. .....lb.	.0425	.05	.0425	.05	.0425	.07
Broenner's, bbls.....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80	.85
Camphoric.....lb.	....	5.25	...	5.25	.....	5.25
Chlorosulfonic, 1500 lb drums wks.....lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99½%, drs.....lb.	.11½	.12½	.11½	.12½	.11½	.14½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00	1.06
Citric, USP, crystals, 230 lb. bbls.....lb.	.29	.30	.29	.30	.29	.33½
Cleve's, 250 lb bbls.....lb.	.52	.54	.52	.54	.52	.54
Cresylic, 95%, dark drs NY.gal.	.38	.40	.38	.41	.40	.47
97-99%, pale drs NY.....gal.	.40	.42	.40	.44	.42	.50
Formic, tech 90%, 140 lb. cby.....lb.	.10½	.12	.10½	.12	.10½	.12
Furoic, tech., 100 lb. drums.lb.	....	.35	...	.35	.....	.....
Gallic, tech, bbls.....lb.	.60	.70	.60	.70	.60	.70
USP, bbls.....lb.	....	.74	...	.74	.....	.74
Gamma, 225 lb bbls wks.....fb	.77	.79	.75	.79	.75	.80
H, 225 lb bbls wks.....lb.	.65	.70	.60	.70	.60	.65
Hydriodic, USP, 10% soln cby lb.	.50	.51	.50	.51	.59	.67
Hydrobromic, 48%, coml, 155 lb cbys wks.....lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, CP, see Acid Muriatic.....						
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80	.90
Hydrofluoric, 30%, 400 lb bbls wks.....lb.	....	.06	...	.06	.....	.06
Hydrofluosilicic, 35%, 400 lb. bbls wks.....lb.	.11	.12	.11	.12	.11	.12
Hypophosphorous, 30%, USP, demijohns .....lb.	.75	.80	.75	.80	.75	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½	.12
Laurent's, 250 lb bbls.... ...lb.	.36	.37	.36	.37	.36	.42
Linoleic.....lb.	.16	.16	.16	.16	.16	.16
Maleic, cry. kegs.....lb.	....	.35	...	...	...	...
Malic, powd, kegs.....lb.	.45	.60	.45	.60	.45	.60
Metanilic, 250 lb bbls.....lb	.60	.65	.60	.65	.60	.65
Mixed Sulfuric - Nitric.....						
tanks wks.....N unit	.06½	.07½	.06½	.07½	.07	.07½
tanks wks.....S unit	.008	.01	.008	.01	.008	.01
Monochloroacetic, tech bbl...lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls.....lb.	1.50	1.60	1.50	1.60	1.55	1.70
Muriatic, 18 deg, 120 lb cbys c-1 wks.....100 lb.	....	1.35	...	1.35	.....	1.35
tanks, wks.....100 lb.	....	1.00	...	1.00	.....	1.00
20 degrees, cbys wks...100 lb.	....	1.45	...	1.45	.....	1.45
N & W, 250 lb bbls.....	.85	.95	.85	.95	.85	.95
Naphthionic, tech, 250 lb.....	.60	.65	.60	.65	.60	.65
Nitric, 36 deg, 135 lb cbys c-wks.....100 lb.	....	5.00	...	5.00	.....	5.00
40 deg, 135 lb cbys, c-1 wks.....100 lb.	....	6.00	...	6.00	.....	6.00
Oxalic, 300 lb bbls wks NY....lb.	.11	.11½	.11	.11½	.11	.11½
Phosphoric 50%, U. S. P.....lb.	....	.14	...	.14	.....	.14
Syrupy, USP, 70 lb drs....lb.	....	.14	...	.14	.....	.14
Picramic, 300 lb bbls.....lb.	.65	.70	.65	.70	.65	.70
Picric, kegs.....lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals..... .....lb.	1.40	1.45	1.40	1.45	1.45	1.60
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33	.37
Sebacic tech, drum.....lb.	.58	.58	.58	.58	.....	.....
Sulfanilic, 250 lb. bbls.....lb.	.15	.17	.15	.17	.14½	.16
*Credit of 1c gal on 3 carlots or more.						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Sulfuric, 66 deg, 180 lb cbys 1c-1 wks.....100 lb.	1.60	1.95	1.60	1.95	1.60	1.95
tanks, wks, ton	....	15.00	....	15.00	.....	15.00
1500 lb dr wks.....100 lb.	1.50	1.65	1.50	1.65	1.50	1.65
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.27½	1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks.....ton	....	18.50	....	18.50	.....	18.50
40%, 1c-1 wks net.....ton	....	42.00	....	42.00	....	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran. powd, 300 lb bbls.....lb.	.20½	.21	.20	.21	.20	.25½
Tobias, 250 lb bbls.....lb.	.75	.80	.75	.80	.75	.85
Trichloroacetic bottles.....lb.	2.00	2.75	2.00	2.75	.....	2.75
Kegs.....lb.	....	1.75	....	1.75	.....	2.00
Tungstic, bbls.....lb.	1.40	1.70	1.40	1.70	1.40	1.70
Albumen, blood, 225 lb bbls...lb.	.35	.43	.35	.43	.35	.40
dark.....bbls.,	.10	.17	.10	.17	.10	.20
Egg, edible.....lb.	.80	.81	.74	.81	.75	.90
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.62	.66
Vegetable, edible.....lb.	.65	.70	.60	.70	.60	.65
Technical.....lb.	.50	.55	.50	.55	.50	.55
Alcohol						
Alcohol Butyl, Normal, 50 gal drs c-1 wks.....lb.	....	.123	....	.123	.123	.1595
Drums, 1-c-1 wks.....lb	....	.128	....	.128	.128	.1645
Tank cars wks.....lb.	....	.113	....	.113	.113	.143
Amyl (from pentane) Tanks wks .....lb.	....	.143	.143	.176	.176	.203
Capryl, tech, drums.....lb.	....	.85	....	.85	.....	.85
Diacetone, tanks.....lb.	.15½	.16½	.15½	.16½	.....	.....
Ethyl, USP, 190 pf, 50 gal. bbls.....gal.	2.53½	2.65	2.53½	2.65	2.55	2.65
Anhydrous, drums ...gal.	.54	58	.54	.58	.54	.58
No. 5. *188 pf, 50 gal. drs. drums extra.....gal.	....	.385*	....	.385*	.27	.396
No. S. D. 1, tanks .....gal.	....	.304	....	.304	.....	.....
Furfuryl, tech., 500 lb. drs.lb	....	.40	.40	.45	.....	.....
Isobutyl, ref., gal. drs.....gal.	....	.75	....	.75	.....	.75
Isopropyl, ref, gal drs.....gal.	.45	.50	.45	.50	.45	.65
Propyl Normal, 50 gal dr..gal.	....	.75	....	.75	.....	.75
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80	.82
Alpha-Naphthol, crude, 300 lb. bbls.....lb.	.65	.70	.65	.70	.57	.65
Alpha-Naphthylamine, 350 lb. bbls.....lb.	.32	.34	.32	.34	.32	.34
Alum Ammonia, lump, 400 lb bbls, 1-c-1 wks.....100 lb.	3.00	3.25	3.00	3.25	3.00	3.25
Chrome, 500 lb casks, wks .....100 lb.	4.50	5.25	4.50	5.25	4.50	5.25
Potash, lump, 400 lb casks wks.....100 lb.	3.00	3.50	3.00	3.50	3.00	3.50
Soda, ground, 400 lb bbls wks .....100 lb	3.50	3.75	3.50	3.75	3.50	3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.00	24.30	22.90	24.30
Chloride Anhydrous .....lb.	.04	.08	.04	.09	.05	.09
Hydrate, 96%, light, 90 lb. bbls.....lb.	.15	.16½	.15	.16½	.15	.17
Stearate, 100 lb bbls.....lb.	.13½	.17	.12½	.17	.15	.21
Sulfate, Iron, free, bags c-1 wks.....100 lb.	1.90	1.95	1.90	1.95	1.90	1.95
Coml, bags c-1 wks .100 lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminoazobenzene, 110 lb kegs lb.	....	1.15	....	1.15	.....	1.15
Ammonia						
Ammonia anhydrous Com. tanks	....	.05	....	.05	.05	.05½
Ammonia, anhyd. 100 lb cyl...lb.	.15½	.15½	.15½	.15½	.15½	.15½
Water, 26°, 800 lb dr del...lb.	.02½	.03	.02½	.03	.02½	.03
Ammonia, aqua 26° tanks.... NH cont.....	....	.05	.....	.05	.....	.....
Ammonium Acetate .....lb.	.26	.33	.26	.33	.26	.39
Bicarbonate, bbls., f.o.b. plant .....100 lb.	....	5.15	....	5.15	.....	5.15
Bifluoride, 300 lb bbls.....lb.	.14½	.17	.14½	.17	.14½	.22
Carbonate, tech, 500 lb cs .lb.	.08	.12	.08	.12	.08	.12
Chloride, white, 100 lb. bbls wks .....100 lb.	4.45	4.90	4.45	4.90	4.45	5.15
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25	5.75
Lump, 500 lb cks spot...lb.	.10	.11	.10	.11	.10½	.11½
Lactate, 500 lb bbls.....lb.	.15	.16	.15	.16	.15	.16
Linoleate.....lb.	....	.11	....	.11	.11	.15
Nitrate, tech, casks.....lb.	.06	.10	.06	.10	.06	.10
Oleate, drs.....lb.	....	.10	....	.10	.....	.10
Persulfate, 112 lb kegs.....lb.	.20	.22½	.20	.22½	.20	.27½
Phosphate, tech, powd, 325 lb. bbls.....lb.	.08½	.11½	.08½	.11½	.08½	.12
Sulfate, bulk c-1.....100 lb.	1.15	1.20	1.00	1.20	.90	1.40
Sulfocyanide, kegs.....lb.	.36	.48	.36	.48	.36	.48

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Amyl Acetate, (from pentane) Tanks del. lb.	....	.13½	...	.13½	.157	.17½
Tech., drs del. lb.	.142	.149	.138	.149	.17½	.18
Amyl Alcohol, see Fusel Oil						
Aniline Oil, 960 lb drs & tks. lb.	.14½	.16	.14½	.16	.14½	.16
Annatto, fine lb.	.34	.37	.34	.37	.34	.37
Anthraquinone, sublimed, 125 lb. bbls lb.	....	.45	...	.45	.45	.55
Antimony, metal slabs, ton lots lb.	....	.06½	.05½	.06½	.05	.06½
Needle, powd, bbls lb.	.07	.08	.07	.08	.08½	.09
Chloride, soln (butter of) cbys lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls lb.	.07½	.08¾	.07½	.08¾	.07½	.08¾
Salt, 63% to 65%, tins lb.	.20	.23	.20	.23	.20	.24
Sulfuret, golden, bbls lb.	.16	.20	.16	.20	.16	.20
Vermillion, bbls lb.	.38	.42	.38	.42	.38	.42
Archil, conc, 600 lb bbls lb.	.20	.21	.20	.21	.17	.21
Double, 600 lb bbls lb.	.16	.17	.16	.17	.16	.17
Triple, 600 lb bbls lb.	.16	.17	.16	.17	.16	.17
Argols, 80%, casks lb.	.12½	.13	.12	.13	.12½	.13
Crude, 30%, casks lb.	.06¾	.07¼	.06¾	.07½	.07	.07½
Aroclors, wks lb.	.18	.30	.18	.30	.18	.40
Arsenic, Red, 224 lb kegs, cs. lb.	.10¾	.11½	.09¾	.11½	.09¾	.10
White, 112 lb kegs lb.	.04	.05	.04	.05	.04	.05
Asbestine, c-1 wks ton	13.00	15.00	13.00	15.00	.....	15.00
Barium						
Barium Carbonate, precip, 200 lb. bags wks ton	56.50	58.50	56.50	58.50	47.00	57.00
Nat. (witherite) 90% gr. carlots wks bags ton		40.00	.....	.....	.....	.....
Chlorate, 112 lb kegs NY lb.	.15	.16	.13¾	.16	.13¾	.15
Chloride, 600 lb bbl wks. ton	61.50	65.00	61.50	69.00	63.00	69.00
Dioxide, 88%, 690 lb drs. lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls lb.	.04¾	.05	.04½	.05	.04¾	.05½
Nitrate, 700 lb casks lb.	.....	.07¼	...	.07½	.07	.08
Barytes, Floated, 350 lb bbls wks ton	22.20	30.50	22.20	30.50	22.00	24.00
Bauxite, bulk, mines ton	5.00	6.00	5.00	6.00	5.00	6.00
Bayberry, bags lb.	.14½	.16	.14½	.16	.....	.....
Beeswax, Yellow, crude bags. lb.	.15	.15½	.13	.15½	.14½	.24
Refined, cases lb.	.18	.21	.18	.21	.20	.28
White, cases lb.	.30	.32	.30	.32	.30	.36
Benzaldehyde, technical, 945 lb. drums wks lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks gal.	.....	.22	.20	.22	.....	.20
Ind. Pure, tanks works gal.	.....	.22	.20	.22	.....	.20
Benzidine Base, dry, 250 lb. bbls lb.	.65	.67	.65	.67	.65	.67
Benzoyl, Chloride, 500 lb drs. lb.	.40	.45	.40	.45	.40	.47
Benzyl Chloride, tech drs. lb.	.....	.30	...	.30	.....	.30
Beta-Naphthol, 250 lb bbl wk. lb.	.....	.22	...	.22	.....	.22
Naphthylamine, sublimed, 200 lb bbls. lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls lb.	.53	.58	.53	.58	.53	.58
Blanc Fixe, 400 lb bbls wks. ton	42.50‡	65.00	42.50	75.00	.....	.....
Bleaching Powder, 800 lb drs c-1 wks contract 100 lb.	1.75	2.00	1.75	2.00	1.75	2.00
Blood, Dried, fob, NY Unit	.....	2.35	1.55	2.35	1.20	1.90
Chicago, high grade Unit	.....	3.25	...	.....	.....	.....
S. American shipt Unit	.....	2.50	1.90	2.50	2.00	2.25
Blues, Bronze Chinese Milori Prussian Soluble lb.	.....	.35	...	.35	.....	.35
Bone, raw, Chicago ton	25.00	26.00	19.00	26.00	20.00	22.00
Bone Ash, 100 lb kegs lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls lb.	.05½	.08½	.05½	.08½	.05½	.08½
Meal, 3% & 50%, Imp. ton	22.00	25.00	18.00	25.00	20.00	23.00
Borax, bags lb.	.018	.02	.018	.02	.018	.03½
Bordeaux, Mixture, 16% pwd. lb.	.11½	.13	.11½	.13	.11½	.13
Paste, bbls lb.	.11½	.13	.11½	.13	.11½	.13
Brazilwood, sticks, shpmt. lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases lb.	.36	.43	.36	.43	.36	.43
Bronze, Aluminum, powd blk. lb.	.50	.75	.50	.75	.60	1.20
Gold bulk lb.	.40	.55	.40	.55	.55	1.25
Butanes, com 16.32° group 3 tanks lb.	.....	.04	.02¾	.04	.....	.....
Butyl, Acetate, normal drs. lb.	.134	.139	.134	.139	.134	.166
Tank, wks. lb.	.....	.124	...	.124	.124	.143
Aldehyde, 50 gal drs wks. lb.	.31½	.36	.31½	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether)	.....	....	....	....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether)						
Furoate, tech., 50 gal. dr. lb.	.....	.60	.50	.60	.....	.50
Propionate, drs lb.	.20	.22	.20	.22	.20	.25
Stearate, 50 gal drs. lb.	.25	.25½	.25	.25½	.25	.25½
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes lb.	.65	.75	.65	.75	.65	.90
Calcium, Acetate, 150 lb bags c-1 100 lb.	.....	3.00	2.50	3.00	2.00	2.50
Arsenate, 100 lb bbls c-1 wks lb.	.05½	.06	.05½	.06	.05½	.06
Carbide, drs lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-1 lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks ton	.....	19.50	19.50	21.00	.....	21.00
Solid, 650 lb drs c-1 fob wks ton	.....	17.50	17.50	18.00	.....	18.00
Calcium Furoate, tech, 100 lb. drums lb.	.....	.30	....	.30	.....	.30
Nitrate, 100 lb bags ton	24.00	26.00	24.00	26.00	34.00	35.00
Palmitate, bbls lb.	.16	.19	.16	.19	.....	.....
Peroxide, 100 lb drs lb.	.....	1.25	....	1.25	.....	1.25

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.
*Argentine grades 1c higher.

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Phosphate, tech, 450 lb bbls. lb.	.07½	.08	.07½	.08	.07½	.08¾
Resinate, precip., bbls lb.	.13	.14	....	....	.....	.....
Stearate, 100 lb. bbls lb.	.13½	.17	.12½	.17	.16	.18
Camphor, slabs lb.	.....	.42	.35½	.42	.....	.....
Powder lb.	.39	.43	.38	.43	.....	.....
Camwood, Bark, ground bbls. lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags lb.	.09	.10	.09	.11	.10	.14
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)	.....	.....	....	...	.....	.....
Carbon, Decolorizing, drums c-1 lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases 1c-1 NY lb.	.06	.12	.06	.12	.06	.12
Bisulfide, 500 lb drs 1c-1 NY lb.	.05½	.06	.05½	.06	.05½	.06
Dioxide, Liq. 20-25 lb cyl. lb.	..	.06	....	.06	.....	.06
Tetrachloride, 1400 lb drs delivered. lb.	.05¼	.06	.05¼	.07	.06¼	.07
Carnauba Wax, Flor, bags lb.	.....	.25	.23	.25	.23	.28
No. 1 Yellow, bags lb.	.....	.26	.20	.26	.21	.24
No. 2 N Country, bags lb.	.14	.15	.14	.15	.13	.16
No. 2 Regular, bags lb.	.....	.24	.20	.24	.20	.24
No. 3 N. C. lb.	.12½	.16	.11½	.16	.11	.13
No. 3 Chalky lb.	.12½	.13½	.12	.13½	.11	.13
Casein, Standard, Domestic, ground lb.	.10½*	.11	.06½	.11	.04¾	.07½
80-100 mesh carlots, bags lb.	.11	.11½	....	....	.....	.....
Cellosolve (see Ethylene glycol mono ethyl ether)						
Acetate (see Ethylene glycol mono ethyl ether acetate)						
Celluloid, Scraps, Ivory cs. lb.	.13	.14	.13	.15	.13	.15
Shell, cases lb.	.18	.20	.18	.20	.18	.20
Transparent, cases lb.	.....	.16	....	.16	.....	.15
Cellulose, Acetate, 50 lb kegs. lb.	.80	.90	.80	.90	.80	.90
Chalk, dropped, 175 lb bbls. lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks. lb.	.02	.03¾	.02	.03¾	.02	.03¾
Light, 250 lb casks lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Charcoal, Hardwood, lump, bulk wks bu.	.18	.19	.18	.19	.18	.19
Willow, powd, 100 lb bbl. wks lb.	.06	.06¼	.06	.06¼	.06	.06¼
Wood, powd, 100 lb bbls. lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks. lb.	.01¾	.02	.01¾	.02	.01¾	.02
25% tks wks lb.	.....	.01¾	.012	.01¾	.01¾	.02¼
Powd, 60%, 100 lb bgs wks. lb.	.....	.04¾	....	.04¾	.....	.04¾
Powd, decolorized bgs wks. lb.	.04¾	.05	.04¾	.05	.04¾	.06
China Clay, lump, blk mines. ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract lb.	.....	.05½†	....	.05½	....	.05½
Liq tank or multi-car lot cyls wks contract 100 lb.	.....	1.75	....	1.75	1.55	1.75
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks lb.	.06	.07½	.06	.07½	.06	.10½
Chloroform, tech, 1000 lb drs. lb.	.15	.16	.15	.16	.15	.16
Chloropicrin, comml cyls lb.	1.00	1.35	1.00	1.35	1.00	1.35
Chrome, Green, CP lb.	.23	.29	.23	.29	.23	.29
Commercial lb.	.06½	.10	.06¼	.10	.06¼	.11
Yellow lb.	.14	.15	.14	.15	.14	.18
Chromium, Acetate, 8% Chrome bbls lb.	.05	.05½	.04½	.05½	.04½	.05½
20° soln, 400 lb bbls lb.	.....	.05½	....	.05½	.....	.05½
Fluoride, powd, 400 lb bbl. lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls lb.	.28	.33	.28	.33	.28	.35½
Coal tar, bbls bbl.	8.00	9.00	8.00	9.00	10.00	10.50
Cobalt Acetate, bbls lb.	.75	.80	....	....	.....	.....
Carbonate tech., bbls lb.	1.34	1.40	....	....	.....	.....
Hydrate, bbls lb.	1.66	1.76	....	....	.....	.....
Linoleate, paste, bbls lb.	.39	.40	....	....	.....	.....
Resinate, fused, bbls lb.	.....	.12½	....	....	.....	.....
Cobalt Oxide, black, bags lb.	1.15	1.25	1.15	1.25	1.15	1.45
Cochineal, gray or black bag. lb.	.36	.42	.36	.42	.38	.57
Teneriffe silver, bags lb.	.37	.43	.37	.43	.39	.57
Copper, metal, electrol. 100 lb.	.....	7.25	5.00	7.25	5.05	7.25
Carbonate, 400 lb bbls lb.	.07	.15½	.07	.15½	.07	.16½
Chloride, 250 lb bbls lb.	.17	.18	.17	.18	.17	.25
Cyanide, 100 lb drs lb.	.39	.40	.39	.40	.39	.40
Oleate, precip., bbls lb.	.....	.20	....	....	.....	.....
Oxide, red, 100 lb bbls lb.	.14¾	.15	.14¾	.15	.15	.16
Resinate, precip., bbls lb.	.18	.19	....	....	.....	.....
Stearate, precip., bbls lb.	.35	.40	....	....	.....	.....
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-1 wks. 100 lb.	.....	3.25	3.00	3.25	2.75	3.10
Copperas, crys and sugar bulk c-1 wks bags ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls. 100 lb.	.....	2.73	2.61	2.73	.....	.....
43 deg., bbls 100 lb.	.....	2.78	2.66	2.78	.....	.....
Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cottonseed, S. E. bulk c-1. ton	.....	26.50	....	26.50	.....	26.50
Meal S. E. bulk ton	.....	.....	....	....	.....	.....
7% Amm., bags mills. ton	13.25	38.00	13.25	38.00	13.25	38.00
Cream Tartar, USP, 300 lb. bbls lb.	.14½	.15	.14½	.15	.15½	.20½
Creosote, USP, 42 lb cbys. lb.	.40	.42	.40	.42	.40	.42
Oil, Grade 1 tanks gal.	.11	.12	.11	.12	.11	12½
Grade 2 gal.	.10	.11	.10	.11	.10	.11½
Grade 3 gal.	.09	.11	.09	.11	.09	.11½
Cresol, USP, drums lb.	.10½	.11	.10½	.11	.10½	.11
Crotonaldehyde, 50 gal dr. lb.	.32	.36	.32	.36	.32	.36
Cudbear, English lb.	.19	.25	.16	.25	.16	.17
Cutch, Rangoon, 100 lb bales. lb.	.05½	.07	.05½	.07	.08¾	.12
Borneo, Solid, 100 lb bale. lb.	.....	.03¾	.02½	.03¾	.03	.07
Cyanamide, bags c-1 frt allowed Ammonia unit	.....	1.02½	.97½	1.02½	. ..	.97½

		Current Market	1933 Low	1933 High	1932 Low	1932 High
Dextrin, corn, 140 lb bags	100 lb.	3.29	3.49	2.89	3.49	2.99	3.67
White, 140 lb bags	100 lb.	3.24	3.44	2.94	3.44	2.94	3.37
Potato Yellow, 220 lb bgs	lb.	.07¾	.08¾	.07¾	.09	.08	.09
White, 220 lb bags 1c-1	lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 lb bags 1c-1	lb.	.06¾	.07¾	.06¾	.08	.07	.08¾
Diamylether, wks., drums	lb.		.60	....	....	....	....
Diamylphthalate, drs wks	gal.		.20½	....	....	....	....
Dianisidine, barrels	lb.	2.35	2.70	2.35	2.70	2.35	2.70
Dibutylphthalate, wks	lb.	.20½	.21	.20½	.22	.218	.23½
Dibutyltartrate, 50 gal drs	lb.	.29½	.31½	.29½	.21	.29½	.31½
Dichloroethylether, 50 gal drs	lb.		.16	....	.16	....	.16
Dichloromethane, drs wks	lb.	.55	.65	.55	.65	.55	.65
Diethylamine, 400 lb drs	lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylcarbonate, com. drs.	gal.		.31½	....	....	....	....
Diethylaniline, 850 lb drs	lb.	.52	.55	.52	.55	.55	.60
Diethyleneglycol, drs	lb.	.14	.16	.14	.16	.14	.16
Mono ethyl ether, drs	lb.	.15	.16	.15	.16	.15	.16
Mono butyl ether, drs	lb.		.26	....	.26	.24	.30
Diethylene oxide, 50 gal drs	lb.	.26	.27	.26	.27	....	....
Diethylorthotoluidin, drs	lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums	lb.		.20	.20	.26	.23	.26
Diethylsulfate, technical, 50 gal drums	lb.		....	....	....	.30	.35
Digtycol Oleate, bbls	lb.		.16	....	....	....	....
Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis	lb.		1.20	....	....	....	....
Dimethylaniline, 340 lb drs	lb.	.26	.28	.25	.28	.25	.27
Dimethyl phthalate drs	lb.		.24½	....	....	....	....
Dimethylsulfate, 100 lb drs	lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls	lb.		.18	....	.18	.15	.16
Dintrochlorobenzene, 400 lb bbls	lb.	.13	.15	.13	.15	.13	.15
Dinitronaphthalene, 350 lb bbls	lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls	lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls	lb.	.15	.16	.15	.17	.16	.17
Dioxan (See Diethylene Oxide)			....	....	....	....	....
Diphenyl	lb.	.15	.25	.15	.40	.20	.40
Diphenylamine	lb.	.31	.34	.31	.34	.34	.37
Diphenylguanidine, 100 lb bbl	lb.	.30	.35	.30	.35	.30	.35
Dip Oil, 25%, drums	lb.	.23	.25	.23	.25	.26	.30
Divi Divi pods, bgs shipmt	ton	28.00	29.00	26.00	29.00	26.00	30.00
Extract	lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb cases	lb.	.41	.43	.40	.43	.40	.52
Epsom Salt, tech, 300 lb bbls c-1 NY	100 lb.		2.20	....	2.20	1.70	1.90
Ether, USP anaesthesia 55 lb. drs.	lb.	.22	.23	.22	.23	.22	.23
(Cone)	lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal. drums	lb.	.07‡	.08	.07	.08	....	....
Synthetic, wks, drums	lb.	.08	.09	....	....	....	....
Ethyl Acetate, 85% Ester tanks	lb.	.07½	.08	.07½	.09	.08½	.09
drums	lb.	.08½	.09	.08½	.10	.09½	.10
Anhydrous, tanks	lb.	.09	.10	.09	.10	....	.10
drums	lb.	.10	.10½	.10	.10½	....	.10½
Acetoacetate, 50 gal drs	lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs	lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums	lb.	.50	.55	.50	.55	.50	.55
Carbonate, 90%, 50 gal drs gal.		1.85	1.90	1.85	1.90	1.85	1.90
Chloride, 200 lb drums	lb.		.22	....	.22	....	.22
Chlorocarbonate, cbys	lb.		.30	....	.30	....	.30
Ether, Absolute, 50 gal drs	lb.	.50	.52	.50	.52	.50	.52
Furoate, 1 lb tins	lb.		1.00	1.00	5.00	....	5.00
Lactate, drums works	lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs.	lb.		.30	....	.30	....	.30
Oxalate, drums works	lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks	lb.	.30	.30½	.30	.30½	....	.30½
Ethylene Dibromide, 60 lb dr.	lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys. chloro, cont	lb.	.75	.85	.75	.85	.7	.85
Dichloride, 50 gal drums	lb.	.05	.09	.05	.09	.0595	.07
Glycol, 50 gal drs wks	lb.	.25	.28	.25	.28	.25	.28
Mono Butyl Ether drs wks			.20	....	.20	.20	.24
Mono Ethyl Ether drs wks		.15	.17	.15	.17	.15	.20
Mono Ethyl Ether Acetate dr. wks		.16½	.18	.16½	.18	.16½	.23
Mono Methyl Ether, drs.	lb.	.21	.23	.21	.23	.21	.23
Stearate		.18	.18	.18	.18	.18	.18
Oxide, cyl	lb.		.75	....	.75	.75	2.00
Ethylidenaniline	lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk	ton	15.00	20.00	15.00	20.00	15.00	20.00
Powdered, bulk works	ton	15.00	21.00	15.00	21.00	15.00	21.00
Ferric Chloride, tech, crystal 475 lb bbls	lb.	.04½	.07	.04½	.07	.04½	.07½
Fish Scrap, dried, wks	unit		2.25*	1.85	2.35*	1.60	3.00
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis	unit		2.00†	1.85	2.00†	1.40	2.40
Fluorspar, 98%, bags		28.00	35.50	28.00	35.50	28.00	46.00

*& 10; †& 50

Formaldehyde

Formaldehyde, aniline, 100 lb. drums	lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks	lb.	.06	.07	.06	.07	.06	.07¾
Fossil Flour		.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines	ton	15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-1 bags	ton	24.00	30.00	24.00	30.00	24.00	30.00
Furfural (tech.) drums wks,	lb.	.10§	.15	.10	.15	....	.10
Furfuramide (tech) 100 lb dr.	lb.		.30	....	.30	....	.30
Furfuryl Acetate, 1 lb tins	lb.		5.00	....	5.00	....	5.00
Fusel Oil, 10% impurities	lb.		.14½	....	.14½	....	....
Fustic, chips	lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes	lb.	.18	.20	.18	.20	.18	.20
Liquid 50°, 600 lb bbls	lb.		.08	.07	.08	.07	.08
Solid, 50 lb boxes	lb.	.14	.16	.14	.16	.14	.16
Sticks	ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls	lb.	.42	.43	.42	.43	.42	.50

‡Higher price, refined. §Tanks, 1c lower.

		Current Market	1933 Low	1933 High	1932 Low	1932 High
Gall Extract	lb.	.18	.20	.18	.20	.18	.20
Gambier, common 200 lb cs.	lb.	.03½	.06½	.03	.07	.06½	.07
Singapore cubes, 150 lb bg.	lb.	.05¼	.06¾	.05¼	.07	.07¾	.09
Gelatin, tech, 100 lb cases	lb.	.45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-1 wks.	100 lb.	1.00	1.70	1.00	1.70	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-1 NY	100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb bags	100 lb.		2.33	....	2.33	2.36	2.75
Glue, medium white, bbls	lb.	.12	.13	.12	.13	.15½	.20
Pure white, bbls	lb.	.18	.20	.18	.20	.18	.27
Glycerin, CP, 550 lb drs	lb.		.10½	....	.10½	.09¾	.11½
Dynamite, 100 lb drs	lb.	.08¼	.08¾	.07½	.08¾	.07½	.09¾
Saponification, tanks	lb.		.05	....	.05	.04½	.06½
Soap Lye, tanks	lb.	.04½	.04¾	.04	.04¾	.03¾	.05
Glyceryl Stearate, bbls	lb.		.18	.17	.18	....	.17
Graphite, crude, 220 lb bgs.	ton	12.00	23.00	12.00	23.00	12.00	35.00
Flake, 500 lb bbls	lb.	.05	.06	.05	.06	.05	.09

Gums

Gum Accroides, Red, coarse and fine 140-150 lb bags	lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½
Powd, 150 lb bags	lb.	.06	.06½	.06	.06½	.06	.06½
Yellow, 150-200 lb bags	lb.	.18	.20	.18	.20	.18	.20
Animi (Zanzibar) bean & pea 250 lb cases	lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases	lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts	lb.	.06	.06½	.05¾	.06½	....	....
Asphaltum, Barbadoes (Manjak) 200 lb bags	lb.	.03	.06	.03	.05	.04	.06
Egyptian, 200 lb cases	lb.	.13	.15	.13	.15	.13	.15
Gamboge, pipe, cases	lb.	.55	.60	.42	.60	....	....
Powdered, bbls	lb.	.60	.65	.50	.65	....	....
Gilsonite Selects, 200 lb bags	ton	30.50	32.90	30.50	32.90	30.50	32.90
Damar Batavia standard 136, lb. cases	lb.	.09¼	.10	.08½	.10	.08½	.09
Batavia Dust, 160 lb bags	lb.	.04¾	.05½	.04	.05½	.04	.05½
E Seeds, 136 lb cases	lb.	.06	.06½	.05½	.06½	.05½	.06½
F Splinters, 136 lb cases and bags	lb.	.05½	.06	.05½	.06	.05½	.06
Singapore, No. 1, 224 lb cases	lb.	.10	.11	.09½	.11	.10½	11
No. 2, 224 lb cases	lb.	.07½	.08	.07	.08	.06	.07½
No. 3, 180 lb bags	lb.	.04½	.05	.04½	.05	.04½	.05
Benzoin Sumatra, U. S. P. 120 lb. cases	lb.	.18	.22	.17	.22	.18	.22
Copal Congo, 112 lb bags, clean opaque	lb.	.16½	.17	.16½	.17	.16½	.17
Dark, amber	lb.	.07	.09	.06	.09	.06	.07
Light, amber	lb.	.10	.14	.08	.14	.08	.09
Water, white	lb.	.37	.45	.37	.45	.37	.45
Kino, tins	lb.	.48	.50	....	....	....	....
Mastic	lb.	.29½	.30	.26¾	.30	.26¾	.40
Manila 180-190 lb baskets							
Loba A	lb.	.10	.11	.09	.11	.09	.11
Loba B	lb.	.09½	.10½	.08	.10½	.08	.08½
Loba C	lb.	.09	.10	.07	.10	.07	.08
M A Sorts	lb.	.05½	.06	.05	.06	.04½	.05
D B B Chips	lb.	.07½	.08	.05½	.08	.05	.06½
East Indies chips, 180 lb bags	lb.	.04½	.05	.04½	.05	.04½	.05½
Pale bold, 224 lb cs.	lb.	.12	.13	.05½	.13	.06	.08
Pale nubs, 180 lb bags	lb.	.04	.05	.03	.05	.03½	.05
Pontianak, 224 lb cases							
Bold gen No. 1	lb.	.14	.15	.14	.15	.14	.16
Gen. chips spot	lb.	.05	.06	.05	.07	.05	.08
Elemi, No. 1, 80-85 lb cs.	lb.	.10	.11	.09	.11	.09	.09½
No. 2, 80-85 lb cases	lb.	.09½	.10½	.08½	.10½	.08½	.09
No. 3, 80-85 lb cases	lb.	.08	.08½	.08	.08½	.08	.08½
Ghatti, sol. bags	lb.	.06	.07	....	....	....	....
Karaya, pow. bbls xxx	lb.	.20	.23	....	....	....	....
xx	lb.	.15	.16	....	....	....	....
No. 1	lb.	.09	.12	....	....	....	....
No. 2	lb.	.08	.09	....	....	....	....
Kauri, 224-226 lb cases No. 1	lb.	.20	.25	.20	.25	.20	.42
No. 2 fair pale	lb.	.12½	.16	.12½	.16	.12½	.30
Brown Chips, 224-226 lb. cases	lb.	.10	.12	.10	.12	.10	.12
Bush Chips, 224-226 lb. cases	lb.	.22	.24	.22	.24	.22	.24
Pale Chips, 224-226 lb cases	lb.	.11	.14	.11	.14	.11	.14
Sandarac, prime quality, 200 lb. bags & 300 lb. casks	lb.	.24½	.25	.21	.25	.23	.25½
Senegal, picked bags	lb.	.14	.16	....	....	....	....
Thus, bbls	280 lbs.	8.00	8.25	....	....	....	....
Strained	280 lbs.	8.00	8.25	....	....	....	....
Tragacanth, No. 1 bags	lb.	.65	.70	.65	.75	....	....
Yacca, bags	lb.	.03	.04	....	....	....	....
Helium, 1 lit. bot.	lit.		25.00	....	25.00	....	25.00
Hematine crystals, 400 lb bbls	lb.	.10	.18	.10	.18	.10	.18
Paste, 500 bbls	lb.		.11	....	.11	....	.11
Hemlock 25%, 600 lb bbls wks	lb.	.03½	.04½	.03½	.04½	.03	.04½
Bark	ton		16.00	....	16.00	....	16.00
Hexalene, 50 gal drs wks	lb.		.30	....	.30	.30	.40
Hexane, normal 60-70° C. Group 3, tanks	gal.		.11	....	....	....	....
Hexamethylenetetramine, drs	lb.	.46	.47	.46	.47	.46	.47
Hoof Meal, f.o.b. Chicago	unit	.90	1.00	.75	1.00	.75	1.35
South Amer. to arrive	unit	1.40	1.50	1.40	1.50	1.25	1.65
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride	lb.		3.15	....	3.15	....	3.15
Hypernic, 51°, 600 lb bbls	lb.	.11	.12	.11	.12	.11	.12
Indigo Madras, bbls	lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums	lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid	lb.		.12	....	.12	....	.12
Iodine, crude	per kilo.		£1 5s	....	....	....	....
Resublimed, kegs	lb.	2.80	2.85	2.65	2.80	....	....

Prices Current

Irish Moss
Phosphate Rock

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Irish Moss, ord. bales lb.	.05	.06	....	....	.....	.....
Bleached, prime, bales lb.	.07	.08	....	....	.....	.....
Iron Chloride see Ferric or Ferrous						
Iron Nitrate, kegs lb.	.09	.10	.09	.10	.09	10
Coml, bbls 100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Oxide, English lb.	.04	.10	.04	.10	.04	.10
Japan Wax, 224 lb cases lb.	.....	.05¼	.05½	.06¼	.06	.09
Kieselguhr, 95 lb bgs NY						
Brown ton	60.00	70.00	60.00	70.00	60.00	70 00
Lead Acetate, bbls wks. 100 lb.	8.50	9.00	8.50	9.50	9.00	10.00
White crystals, 500 lb bbls wks 100 lb.	9.50	10.00	9.50	10.50	10.00	11.00
Arsenate, drs lc-l wks lb.	.09	.10½	.09	.10½	.09½	.13
Dithiofuroate, 100 lb dr lb.	.....	1.00	....	1.00	.....	1.00
Metal, c-l NY 100 lb.	.....	3.90	3.00	3.90	2.70	3.75
Nitrate, 500 lb bbls wks lb.	.10½	.14	.10½	.14	.10½	.14
Oleate, bbls lb.	.15	.16	.15	.16	.15	.18
Lead Oxide Litharge, 500 lb. bbls lb.	.....	.06¼	.05½	.06¼	.05½	.07
Oleate, bbls lb.	.....	.15	....	....	.....	.....
Red, 500 lb bbls wks lb.	.....	.07¼	.06½	.07¼	.06½	.07
Resinate, precip., bbls lb.	.18	.18½	....	....	.....	.....
Stearate, bbls lb.	.22	.23	....	....	.....	.....
White, 500 lb bbls wks lb.	.06	.07	.06	.07	.06	.07
Sulfate, 500 lb bbls wk lb.	.....	.06	.05½	.06	.05½	.06
Leuna saltpetre, bags c.i f ton	.....	Nom	....	Nom	.....	Nom.
S. points c.i.f ton	.....	Nom.	....	Nom.	.....	Nom.
Lime, ground stone bags ton	.....	4.50	....	4.50	.....	4.50
Live, 325 lb bbls wks bbl.	.....	1 65	....	....	.....	.....
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls gal.	.15	.17	.15	.17	.15	.17
Linseed cake, bulk ton	.....	20 50	17.50	20 50	.....	.....
Linseed Meal ton	.....	28.00	28.00	29.50	29 50	.....
Lithopone, 400 lb bbls lc-l wks lb.	.04½	.05	.04½	.05	.04½	.05
Logwood, 51°, 600 lb bbls lb.	.05	.08	.05	.08	.05	.08
Chips, 150 lb bags lb.	.03	.03½	.03	.03½	.03	.03½
Solid, 50 lb boxes lb.	.08	.12½	.08	.12½	.08	.12½
Sticks ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ton	46.00	56.00	46.00	56.00	50.00	60.00
Magnesium Carb, tech, 70 lb. bags NY lb.	.05½	.06¼	.05½	.06¼	.05½	.06½
Chloride flake, 375 lb. drs c-l wks ton	34.00	36.00	34.00	36.00	35.00	36.00
Imported shipment ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ton	.....	31.00	....	31.00	.....	31.00
Fluosilicate, crys, 400 lb bbls wks lb.	.10	10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls lb.	.....	.42	....	.42	.....	.42
Heavy, 250 lb bbls lb.	.....	.50	....	.50	.....	.50
Palmitate, bbls lb.	.19	.23	....	....	.....	.....
Peroxide, 100 lb cs lb.	1.00	1.25	1.00	1.25	1.00	1.25
Silicofluoride, bbls lb.	.09½	.10¼	.09½	.10¼	.09½	.10¼
Stearate, bbls lb.	.18	.20	.16½	.20	.16½	.26
Manganese Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.19
Chloride, 600 lb casks lb.	.07	.08	.07	.08	.07	.08½
Dioxide, tech (peroxide) drs lb.	.03½	.06	.03½	.06	.03½	.06
Linoleate, lig. drums lb.	.18	.19	....	....	.....	.....
Resinate, fused, bbls lb.	.08½	.08½	....	....	.....	.....
precip., bbls lb.	.11½	.12½	....	....	.....	.....
Sulfate, 550 lb drs NY lb.	.07	.08	.07	.08	.07	.08
Mangrove 55%, 400 lb bbls lb.	.....	.04	....	.04	.....	.04
Bark, African ton	26.00	27.00	22.00	27.00	21.00	25.00
Marble Flour, bulk ton	12.00	13.00	12.00	13.00	12.00	15.00
Mercurous chloride lb.	.67	.72	.67	.72	.67	.93
Mercury metal 76 lb flask	56 50	58.00	48.00	58.00	47.00	74.50
Meta-nitro-aniline lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-toluidine 200 lb. bbls lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb. bbls lb.	.80	.84	.80	.84	80	.84
Meta-toluene-diamine, 300 lb bbls lb.	.67	.69	.67	.69	.67	.69
Methanol, (Wood Alcohol)						
*Crude, tanks gal.	.....	.20	.20	.20	.....	.....
95% tanks gal.	.33	.35	.33	.35	.33	.35
97% tanks gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drums cars gal.	.....	.39½	.37½	.39½	.37½	.41½
*Synthetic tanks gal.	.....	.35½	....	.35½	.....	.35½
*Denat. grade, tanks gal.	.....	.40	.35	.40	.....	.....
Methyl Acetate drums 82% gal.	.12	.13	.12	.13	.12	.17½
99% gal.	.....	.15	....	.15	.....	.15
Acetone, drums gal.	.42	.44	.42	.49	.47	.55
Hexyl Ketone, pure lb.	.....	1.20	....	1.20	.....	1.20
Anthraquinone lb.	.65	.67	.65	.67	.65	95
Cellosolve, (See Ethylene Glycol Mono Methyl Ether)	.....	.....	.....	.....	.....	.....
Chloride, 90 lb cyl lb.	.45	.45	.45	.45	45	.45
Mica, dry grd. bags wks lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs lb.	.....	3.00	....	3.00	.....	3 00
Molasses, blackstrap, tanks f.o.b. N. Y gal.	.....	.05	.05	.05	.....	.....
Monochlorobenzene, drums see, Chlorobenzene, mono lb.						
Monomethylparaminosulfate 100 lb drums lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags lb.	.05½	.06½	.03½	.06½	.03½	.07
Myrobalans 25%, liq bbls lb.	.03¾	.04¼	.03¾	.04¼	.03¾	.04½
50% Solid, 50 lb boxes lb.	.05	.05½	.05	.05½	.05	.05½
J1 bags ton	27 00	28 00	27 00	35.00	34.00	35.00
J2 bags ton	16 00	16 75	15.50	16 75	15.25	18.50
R2 bags ton	.....	16 50	15.00	16 50	14.75	17.50
Naphtha, v.m.& p. (deodorized) tanks gal.	.08½	.09	.08½	.09	.08½	.10
Naphthalene balls, 250 lb bbls						
*delivered basis (east of Miss. River)						

	Current Market	1933 Low	1933 High	1932 Low	1932 High
wks lb.	.05½	.06½	.05½	.06½	.03¾	.05½
Crushed, chipped bgs wks lb.	.....	.04½	....	.04½	.....	.04½
Flakes, 175 lb bbls wks lb.	.....	.04½	....	.04½	.03¾	.04½
Nickel Chloride, bbls lb.	.17	.18	.17	.18	.18	.20
Oxide, 100 lb kegs NY lb.	.35	.37	.35	.37	.35	.40
Salt bbl. 400 bbls lb NY lb.	.11	.13	.11	.13	.10½	.13
Single, 400 lb bbls NY lb.	.11	.12	.11	.12	.10½	.12
Metal ingot lb.	.35	.35	.35	.35	.35	35
Nicotine, free 40%, 8 lb tins, cases lb.	1.05	1.30	1.05	1.30	1.25	1.30
Sulfate, 55 lb. drums lb.	.74½	.86	.74½	.86	.74½	.....
Nitre Cake, bulk ton	10.00	12.00	10.00	12.00	10.00	12.00
Nitrobenzene, redistilled, 1000 lb drs wks lb.	.09	.09½	.09	.09½	.09	.09½
Nitrocellulose, c-l-l-cl, wks lb.	.27	.33	.27	.33	25	.36
Nitrogenous Material, bulk unit	.....	1.80	1.50	1.80	1.35	1.55
Nitronaphthalene, 550 lb bbls lb.	.....	.25	....	.25	....	25
Nitrotoluene, 1000 lb drs wks lb.	.14	.15	.14	.15	.14	.15
Nutgalls Aleppy, bags lb.	.....	.18	....	.18	.....	.18
Chinese, bags lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole ton	20.00	23.00	20.00	23.00	20.00	23.00
Orange-Mineral, 1100 lb casks NY lb.	.....	.11	.10½	.11	.09½	.10¾
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2 1	2.25
Orthoanisidine, 100 lb drs lb.	1.00	1.15	1.00	1.15	1.15	1.50
Orthochlorophenol, drums lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums lb.	.13	.15	.13	.15	.13	.22
Orthodichlorobenzene, 1000 lb. drums lb.	.07	.10	.07	.10	07	.10
Orthonitrochlorobenzene, 1200 lb drs wks lb.	.28	.29	.28	.29	28	29
Orthonitrotoluene, 1000 lb drs wk lb.	.14	.16	.14	.16	.14	.18
Orthonitrophenol, 350 lb dr lb.	.52	.80	.52	.90	.85	.90
Orthotoluidine, 350 lb bbl lc-l lb.	.14½	.20	.14½	.22	.20	22
Orthonitroparachlorphenol, tins lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid lb.	.06	.06½	.06	.06½	.06	.07½
Powdered, 100 lb bags lb.	.14½	.15	.14½	.15	14½	.15
Paraffin, refd, 200 lb cs slabs 123-127 deg. M. P lb.	.032	.034	.02	.034	.02½	.03
128-132 deg. M. P lb.	.03½	.03⅝	.03½	.03⅝	.....	.03½
133-137 deg. M. P lb.	.043	.04½	.043	.04½	.04	.04¾
Para Aldehyde, 110-55 gal drs lb.	.20½	.23	.20½	.23	.20½	.23
Aminoacetanilid, 100 lb bg lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb. kegs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kegs lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drums lb.	.....	....	....	....	.....	.....
Cymene, refd, 110 gal dr gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls wks lb.	.15½	.16	.15½	.16	.15½	.16
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs wks lb.	.23	.26	.23	.26	.23	.26
Nitro-orthotoluidine, 300 lb. bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb. bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	.29	.31	.29	.31	.29	.31
Phenylenediamine, 350 lb bbls lb.	1.15	1.20	1.15	1.20	1.15	1 20
Toluenesulfonamide, 175 lb bbls lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb bbls wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk lb.	.....	.58	....	.58	.42	.43
Paris Green, Arsenic Basis 100 lb kegs lb.	.....	.24	....	.24	.24	.27
250 lb kegs lb.	.....	.23	....	.23	.23	.25
Persian Berry Ext., bbls lb.	.25	Nom	.25	Nom	.25	Nom.
Pentane, normal, 28-38° C, group 3, tanks gal.	.....	.07	....	....	.....	.....
Pentasol (see Alcohol, Amyl)						
Pentasol Acetate (see Amyl Acetate)						
Petrolatum, Green, 300l b bbl. lb.	.01⅞	.02	.01⅞	.02	.02	.02½
Petroleum Ethers, tanks 30-60°, Group 3 gal.	.....	.10	....	.10	.....	.....
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3, tanks gal.	.05	.05½	.05	.06¾	.....	.....
Lacquer diluents, Bayonne tanks gal.	.12	.12½	.12	.12½	.....	.....
Group 3, tanks gal.	.06¼	.07½	.06¼	.08	.....	.....
Petroleum thinner 47-49 deg. tanks gal.	.....	.08½	....	.08½	.....	.....
Rubber solvent, stand. grade tanks gal.	.....	.05	.05	.06	.....	.....
Stoddard solvents 48-50 deg. tanks gal.	.04½	.05¼	.04½	.05¾	.....	.....
Phenol, 250-100 lb drums lb.	.14½	.15	.14½	.15	.14½	.15
Phenyl-Alpha-Naphthylamine, 100 lb kegs lb.	.....	1.35	....	1.35	....	1.35
Phenyl Chloride, drums lb.	.....	.16	....	....	.....	.....
Phenylhydrazine Hydrochloride lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	3 10	3.25	3.10	3.25	3.10	3.25
70% basis ton	3.75	3.90	3.75	3.90	3.75	3.90
72% basis ton	4.25	4.35	4.25	4.35	4.25	4.35
75-74% basis ton	5.25	5.50	5.25	5.50	5.25	5.50

Prices Current

Phosphate Rock
Sulfur Brimstone

	Current Market	1933 Low	1933 High	1932 Low	1932 High
75% basis ton	5.75	....	5.75	.....	5.75
77-80% basis ton	6.25	....	6.25	.....	6.25
Tennessee, 72% basis ton	5.00	....	5.00	.....	5.00
Phosphorous Oxychloride 175 lb cyl lb.	.18	.23	.18	.23	.18	.20
Red, 110 lb cases lb.	.....	.45	.40	.45	.40	.46
Yellow, 110 lb cases wks lb.	.28	.33	.27½	.33	.27½	.37½
Sesquisulfide, 100 lb cs lb.	.38	.44	.38	.44	.38	.44
Trichloride, cylinders lb.	.18	.23	.18	.23	.18	.20
Phthalic Anhydride, 100 lb bbls wks lb.	.15	.16	.15	.16	.15	.16
Pigments Metallic, Red or brown bags, bbls, Pa. wks ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drums or bbls Destructive dist. lb.	.59	.62	.59	.62	.59	.63
Prime bbls bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Steam dist. bbls gal.	.52	.54	.52	.54	.54	.61
Pitch Hardwood wks ton	.....	20.00	20.00	25.00	20.00	35.00
Plaster Paris, tech, 250 lb bbls bbl.	3.40	3.50	3.30	3.50	3.30	3.50
Platinum, Refined oz.	24.00	26.00	24.00	26.00	32.00	38.00
Pontol, tanks per gal.	.....	.54	....	.54	.54	.54
Potash, Caustic, wks, solid lb.	.07½	.07¾	.06½	.07¾	.06½	.06½
flake lb.	.0803	.08¼	.0705	.08¼	.0705	.08
Potash Salts, Rough Kainit 12.4% basis bulk ton	.....	9.20	....	9.20	.....	9.20
14% basis ton	.....	9.70	....	9.70	.....	9.70
Manure Salts 20% basis bulk ton	.....	12.00	....	12.00	12.00	12.65
30% basis bulk ton	.....	19.15	....	19.15	.....	19.15
Potassium Acetate lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags ton	.....	37.15	....	37.15	.....	37.15
Pot. & Mag. Sulfate, 48% basis bags ton	.....	27.80	....	27.80	.....	27.80
Potassium Sulfate, 90% basis bags ton	....	42.15	42.15	47.50	47.50	48.25
Potassium Bicarbonate, USP, 320 lb bbls lb.	.07½	.09	.07½	.09	.07¼	.09
Bichromate Crystals, 725 lb casks lb.	.07½	.08¼	.07½	.08¼	.07	.08½
Binoxalate, 300 lb bbls lb.	.14	.17	.14	.17	.14	.17
Bisulfate, 100 lb kegs lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc. 800 lb casks lb.	.05¼	.06½	.04¾	.06½	.0475	.05
Chlorate crystals, powder 112 lb keg wks lb.	.08¼	.09	.08	.09	.08	.08½
Chloride, crys bbls lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kegs lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases lb.	.55	.60	.50	.60	.50	.57½
Metabisulfite, 300 lb. bbl lb.	.10½	.11	.10½	.11	.10½	.13
Oxalate, bbls lb.	.16	.24	.16	.24	.16	.24
Perchlorate, casks wks lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys 500 & 100 lb drs wks lb.	.16	.16½	.16	.16½	.16	.16½
Prussiate, red, 112 lb keg lb.	.....	.35	.32½	.38½	.....	.38½
Yellow, 500 lb casks lb.	.16½	.17	.16½	.17	.16½	.21
Tartrate Neut, 100 lb keg lb.	.....	.21	....	.21	.....	.21
Titanium Oxalate, 200 lb bbls lb.	.21	.23	.21	.23	.21	.23
Propane, group 3, tanks	.....	.07	....	.07	.....	.....
Pumice Stone, lump bags lb.	.04	.05	.04	.05	.04	.05
250 lb bbls lb.	.04½	.06	.04½	.06	.04½	.06
Powdered, 350 lb bags lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commercial, tubs 100 lb.	2.00	2.25	2.00	2.25	2.00	2.45
Linseed Oil, kegs 100 lb.	3.40	3.50	3.40	3.50	3.40	4.75
Pyridine, 50 gal drums gal.	.85	.95	.85	.95	.85	1.25
Pyrites, Spanish cif Atlantic ports bulk unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liquid tks lb.	.02	.02⅜	.02	.02¼	.02	.03
450 lb bbls c-1 lb.	.02½	.02¾	.02½	.02¾	.02½	.03¼
35% Bleaching, 450 lb bbl lb	.02	.02¼	.02	.02¼	.02	.04
Solid, 63%, 100 lb bales cif lb.	.02½	.02¾	.02½	.02¾	.02	.02½
Clarified, 64%, bales lb.	.02½	.03	.02¾	.03	.02½	.03¼
Quercitron, 51 deg liquid 450 lb bbls lb.	.05½	.06	.05½	.06	.05½	.06
Solid, 100 lb boxes lb.	.09½	.13	.09½	.13	.09½	.13
Bark, Rough ton	.....	14.00	....	14.00	.....	14.00
Ground ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks lb.	.40	.44	.40	.44	.40	.44
Red Sanders Wood, grd bbls. lb.	.....	.18	....	.18	.....	.18
Resorcinol Tech, cans lb.	.65	.70	.65	.70	.65	.70
Rosin Oil, 50 gal bbls, first run gal.	.....	....	.42	.43	.41	.45
Second run gal.	.40	.42	.46	.47	.45	.51
Rosin						
Rosins 600 lb bbls 280 lb. unit ex. yard N. Y.						
B	4.15	4.30	2.75	4.30	2.95	3.65
D	4.25	4.30	2.95	4.30	3.15	3.75
E	4.50	4.55	3.55	4.55	3.37½	4.00
F	4.55	4.70	3.85	4.70	3.40	4.15
G	4.60	4.70	3.90	4.70	3.45	4.15
H	4.60	4.70	4.00	4.70	3.45	4.20
I	4.65	4.75	4.05	4.85	3.47½	4.25
K	4.85	4.95	4.60	4.95	3.60	4.65
M	4.90	5.00	4.35	5.00	4.20	5.25
N	5.00	5.10	4.75	5.30	4.65	6.05
WG	5.10	5.20	4.80	5.60	5.25	6.45
WW	5.30	5.40	4.85	6.20	5.85	6.65
Rotten Stone, bags mines ton	23.50	24.00	23.50	24.00	20.00	23.00
Lump, imported, bbls lb.	.05	.07	.05	.07	.05	.07
Selected bbls lb.	.09	.12	.09	.12	.09	.12
Powdered, bbls lb.	.02	.05	.02	.05	.02	.05
Sago Flour, 150 lb bags lb.	.02½	.03	.02½	.03	.02½	.04
Sal Soda, bbls wks 100 lb.	.90	1.00	.90	1.00	.90	1.00
Salt Cake, 94-96% c-1 wks ton	13.00	14.00	13.00	14.00	13.00	15.50
Chrome ton	12.00	13.00	12.00	13.00	12.00	14.50
Saltpetre, double refd granular 450-500 lb bbls lb.	.05¾	.06	.05¾	.06¾	.06	.06¾
Satin, White, 500 lb bbls lb.	.....	.01½	....	.01½	.....	.01½
Shellac Bone dry bbls lb.	.....	.20	.18	.20	.16	.26
Garnet, bags lb.	.14	.15	.15	.16	.15	.20
Superfine, bags lb.	.12½	.13½	.09½	.11¾	.10	.14
T. N. bags lb.	.11½	.12½	.08½	.10¼	.09	.13
Schaeffer's Salt kegs lb.	.48	.50	.48	.50	.48	.50
Silica, Crude, bulk mines ton	8.00	11.00	8.00	11.00	8.00	11.00
Refined, floated bags ton	22.00	30.00	22.00	30.00	22.00	30.00
Air floated bags ton	.....	32.00	....	32.00	.....	32.00
Extra floated bags ton	30.00	35.00	30.00	35.00	30.00	40.00
Silver oz.	.....	.33½	....	....	.....	.....
Silver Nitrate, vials oz.	.24½	.26½	....	....	.....	.....
Soapstone, Powdered, bags f.o.b. mines ton	15.00	22.00	15.00	22.00	15.00	22.00
Soda						
Soda Ash, 58% dense, bags c-l wks 100 lb.	.....	1.17½	....	1.17½	1.17½	.....
58% light, bags 100 lb.	1.15	1.20	1.15	1.20	1.15	1.20
Soda Caustic, 76% grnd & flake drums 100 lb.	2.95	3.00	2.95	3.00	2 90	3.00
76% solid drs 100 lb.	2.50	2.55	2.50	2.55	2.50	2.55
Sodium Abietate, drs lb.	.....	.03	....	.03	....	.03
Acetate, tech 450 lb. bbls wks lb.	.04½	.05	.04½	.05	.04½	.05
Alignate, drs lb.	.....	.50	....	.50	.....	.50
Arsenate, drums lb.	.07¾	.08¾	.07¾	.08¾	.....	.....
Arsenite, drums gal.	.50	.75	.05	.75	.50	.75
Benzoate U.S.P., kegs lb.	.40	.42	....	....	.....	.....
Bicarb, 400 lb bbl 100 lb.	.....	2.25	....	2.25	.....	2.25
Bichromate, 500 lb cks wks lb.	.04¾	.05½	.044	.05½	.044	.05½
Bisulfite, 500 lb bbl wks lb.	.02¾	.03	.02¾	.03	.03	.04
Chlorate, wks lb.	.05¾	.07¾	.05¾	.07¾	.05¾	.07¾
Chloride, technical ton	11.40	14.00	11.40	14.00	12.00	13.00
Cyanide, 96-98%, 100 & 250 lb drums wks lb.	.15½	.16	.15½	.16	.15½	.17
Fluoride, 300 lb bbls wks lb.	.07	.07½	.07	.07½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b. wks lb.	.20	.21	.20	.21	.21	.24
Hypochloride solution, 100 lb. cbys lb.	.....	.05	....	.05	.....	.05
Hyposulfite, tech, pea crys 375 lb bbls wks 100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Technical, regular crystals 375 lb bbls wks 100 lb.	2.40	2.65	2.40	2.65	2.40	2.65
Metanilate, 150 lb bbls lb.	.44	.45	.44	.45	.44	.45
Metasilicate, c-1, wks 100 lb.	2.85	3.25	2.85	3.25	2.85	4.00
Monohydrate, bbls lb.	.....	.02½	....	.02½	.....	.02½
Naphthionate, 300 lb bbl lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-1 NY 100 lb.	.....	1.31	1.26	1.31	1.185	1.73½
Nitrite, 500 lb bbls spot lb.	.07¼	.08	.07¼	.08	.07½	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls lb.	.17	.19	.17	.19	.17	.20
Phosphate, di-sodium, tech. 310 lb bbls 100 lb.	2.20	2.40	2.00	2.40	2.00	2.75
tri-sodium, tech, 325 lb bbls 100 lb.	2.15	2.50	2.15	2.50	2.15	3.20
Picramate, 160 lb kegs lb.	.69	.72	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bb wks lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, 100 lb keg lb.	.15	.20	.15	.20	.15	.20
Silicate, 60 deg 55 gal drs, wks 100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40 deg 55 gal drs, wks 100 lb.	.....	.75	....	.75	.....	.75
Silicofluoride, 450 lb bbls NY lb.	.05½	.06	.04½	.06	.05½	.06¾
Stannate, 100 lb drums lb.	.27½	.30	.18	.30	.17	.19
Stearate, bbls lb.	.20	.25	.20	.25	20	.25
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-1 wks lb.	.02	.02¼	.02	.02¼	.02	.02¼
Sulfide, 80% crystals, 440 lb bbls wks lb.	.02½	.02¾	.02½	.02¼	.02½	.02¼
62% solid, 650 lb drums 1c-1 wks lb.	.03	.03½	.03	.03½	.03	.03½
Sulfite, crystals, 400 lb bbls wks lb.	.03	.03½	.03	.03½	.03	.03½
Sulfocyanide, bbls lb.	.28	.35	.28	.35	.28	.35
Tungstate, tech, crystals, kegs lb.	.57	.67	.57	.67	.60	.88
Spermaceti, blocks, cases lb.	.17	.18	.17	.19	.....	.....
Cakes, cases lb.	.18	.21½	.18	.21½	.....	.....
Spruce Extract, ord., tanks lb.	.....	.00¾	....	.00¾	.00¾	.01
Ordinary, bbls lb.	.....	.01½	....	.01½	.01½	.01¾
Super spruce ext., tanks lb.	.....	.01½	....	.01½	.01½	.01¾
Super spruce ext., bbls lb.	.....	.01¾	....	.01¾	.01¾	.01¾
Super spruce ext. powd., bags lb.	.....	.04	....	.04	.04	.04½
Starch, powd, 140 lb bags 100 lb.	2.49	2.60	2.29	2.60	2.29	2.67
Pearl, 140 lb bags 100 lb.	2.39	2.50	2.19	2.50	2.19	2.84
Potato, 200 lb bags lb.	.03¾	.04	.03¾	.04	.03¾	.06
Imported bags lb.	.....	.05	.04¾	.05	04	.06¼
Soluble lb.	.08	.08½	.08	.08½	.08	.08½
Rice, 200 lb bbls lb.	.07	.08½	.07	.08½	.07½	.10
Wheat, thick bags lb.	.05½	.06	.05½	.06½	.06	.07
Thin bags lb.	.09½	.10	.09½	.10	.09½	.10
Strontium carbonate, 600 lb bbls wks lb.	.07½	.07½	.07½	.07½	.07½	.07½
Nitrate, 600 lb bbls NY lb.	.07	.07½	.07	.07½	.07	.07½
Peroxide, 100 lb drs lb.	.....	1.25	....	1.25	.....	1.25
Sulfur Brimstone, broken rock, 250 lb bag c-1 100 lb.	.....	2.05	....	2.05	.....	2 05
Crude, f. o. b. mines ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100						

Prices Current

Sulfur Chloride
Whale Oil

	Current Market	1933 Low	1933 High	1932 Low	1932 High
lb bags c-1 NY....100 lb.....	2.40	....	2.40	.....	2.40
Heavy bags c-1.....100 lb.....	2.50	....	2.50	.....	2.50
Flowers, 100%, 155 lb bbls c-1 NY.....100 lb.....	3.45	....	3.45	...	3.45
Roll, bbls 1c-1 NY....100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks.....lb.	.05	.05½	.05	.05½	.05	.05½
Yellow, 700 lb drs wks.....lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl....lb.	.07	.07½	.07	.07½	.07	.07½
Extra, dry, 100 lb cyl.....lb	.10	.12	.10	.12	.10	.12
Sulfuryl Chloride.....lb.	.15	.40	.15	.40	15	.40
Talc, Crude, 100 lb bgs NY..ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bgs NY..ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY....ton	18.00	22.00	18.00	22.00	18.00	22.00
Refined, white, bags....ton	35.00	40.00	35.00	40.00	35.00	40.00
Italian, 220 lb bags NY...ton	48.50	50.00	48.50	50.00	40.00	50.00
Refined, white bags.....ton	50.00	55.00	50.00	55.00	50.00	55.00
Superphosphate, 16% bulk, wks.....ton	7.50	8.00	6.50	8.00	7.00	8.00
Run of pile.....ton	7.00	7.50	6.00	7.50	.....	.....
Tankage Ground NY.....unit.....		2.75*	1.70	2.75*	1.30	1.50
Unground.....unit.....		2.50	....	2.50	.....	.....
High grade f.o.b. Chicago.unit.....		3.25	1.40	3.25	1.00	1.80
South American cif.....unit.....		2.50	....	2.50	1.80	2.25
Tapioca Flour, high grade bgs..lb	.03	.05	.03	.05	.03½	.05
Medium grade, bags.....lb.	.03	.04	.03	.04	.03	04
Tar Acid Oil, 15%, drums...gal.	.21	.22	.21	.22	.21	.22
25% drums.....gal.	.23	.24	.23	.24	.23	.24
Terra Alba Amer. No. 1, bgs or bbls mills.....100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bags or bbls...100 lb.	1.00	1.25	1.00	1.25	1.50	2.00
Imported bags.....lb.	.01½	.01½	.01½	.01½	.01½	.01½
Tetrachlorethane, 50 gal dr...lb.	.08½	.09	.08½	.09	.08	.09½
Tetralene, 50 gal drs wks.....lb.	.12	.13	.12	.13	.12	.20
Thiocarbanilid, 170 lb bbl....lb.	.25	.28½	.25	.28½	.25	.28½
Tin.....						
Crystals, 500 lb bbls wks...lb.....		.32½	.24	.32½	.22	.25
Metal Straits NY.....lb.....		.38½	.23	.38½	.211	.24½
Oxide, 300 lb bbls wks.....lb.....		.37½	.27½	.37½	.23	.26½
Tetrachloride, 100 lb drs wks .....lb.	.1937½	.1987½	.126	.1987½	.1420	.1457
Titanium Dioxide 300 lb bbl...lb.	.17½	.19½	.17½	.19½	.17½	.21
Calcium Pigment, bbls.....lb.	.06¼	.06½	.06¼	.06½	.06¼	.07¾
Toluene, 110 gal drs.....gal.....		.35	....	.35	.....	.35
8000 gal tank cars wks....gal.....		.30	....	.30	.....	.30
Toluidine, 350 lb bbls.....lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks.....lb.	.27	.28	.27	.28	.27	.32
Toner Lithol, red, bbls.....lb.	.90	.95	.90	.95	.90	.95
Para, red, bbls.....lb.....		.80	....	.80	.....	.80
Toluidine.....lb.	1.50	1.55	1.50	1.55	1.50	1.55
Triacetin, 50 gal drs wks.....lb.	.32	.36	.32	.36	.32	.36
Trichlorethylene, 50 gal dr...lb.	.09½	.10	.09½	.10	.10	.10½

*&10 †Depends upon grade

	Current Market	1933 Low	1933 High	1932 Low	1932 High
Triethanolamine, 50 gal drs...lb.	.35	.38	.35	.38	.35	.42
Tricresyl Phosphate, drs.....lb.	.21	.26	.21	.26	.21	.26
Triphenyl guanidine.....lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums.....lb.	.37	.39	.37	.39	.50	.65
Tripoli, 500 lb bbls.....100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten, Wolframite..per unit.	10.00	11.00	10.00	11.00	10.00	11.75
Turpentine carlots, bbls....gal.	.46½	.46¾	.46¼	.50	.39	.47¾
Wood Steam dist, bbls....gal.....		.45	.42	.46	.42	.46
Urea, pure, 112 lb cases.....lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f.....ton.....		82.60	....	82.60	.....	82.60
c. i. f. S. points.....ton.....		82.60	....	82.60	.....	82.60
Valonia Beard, 42%, tannin bags.....ton.....		33.00	27.50	33.00	28.50	34.00
Cups, 30-31% tannin.....ton	19.00	20.00	17.00	20.00	19.00	23.50
Mixture, bark, bags.....ton.....		22.00	....	22.00	22.00	26.00
Vermillion, English, kegs.....lb.	1.20	1.25	1.05	1.40	1.28	1.80
Vinyl Chloride, 16 lb cyl.....lb.....		1.00	....	1.00	.....	1.00
Wattle Bark, bags.....ton.....		28.00	24.00	28.00	26.00	33.00
Extract 55%, double bags ex-dock.....lb.	.03	.03½	.03	.03½	.03	.06½
Whiting, 200 lb bags, c-1 wks .....100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-1 NY.....ton.....		13.00	....	13.00	.....	13.00
Gilders, bags c-1 NY...100 lb.....		1.35	....	1.35	.....	1.35
Wood Flour, c-1.....bags	18.00†	24.00	18.00	36.00	.....	.....
Xylene, 10 deg tanks wks...gal.	.27	.29	.27	.29	.....	.29
Commercial, tanks wks...gal.....		.26	....	.26	.....	.26
Xylidine, crude.....lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls.....lb.	.04½	.05	.04½	.05	.....	5.75
Carbonate Tech. bbls NY..lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks.....lb.	.05	.05½	.05	.05½	.05	.06
Gran, 500 lb bbls wks.....lb.	.05½	.06	.05½	.06	.05½	.06
Soln 50%, tanks wks...100 lb.....		3.00	....	3.00	2.25	3.00
Cyanide, 100 lb drums.....lb.	.38	.39	.38	.39	.38	.39
Dithiofuroate, 100 lb dr....lb.....		1.00	....	1.00	.....	1.00
Dust, 500 lb bbls c-1 wks...lb.	.06½	.07½	.04¾	.07½	.041	.0525
Metal, high grade slabs c-1 NY.....100 lb.....		4.52	3.02	4.52	2.87	3.52
Oxide, American bags wk...lb.....		.05¾	....	.05¾	.0485	.07
French, 300 lb bbls wks...lb.	.05¾	.11½	.05¾	.11½	.08½	.11⅞
Palmitate, bbls.....lb.	.17½	.18½	.17½	.18½	.....	.....
Perborate, 100 lb drs.....lb.....		1.25	....	1.25	.....	1.25
Peroxide, 100 lb drs.....lb.....		1.25	....	1.25	.....	1.25
Resinate, fused, dark, bbls..lb.	.05¾	.06½	.05¼	.06½	.....	.....
Stearate, 50 lb bbls.....lb.	.16½	.16¾	.15	.17	.16	.22
Sulfate, 400 bbl wks.....lb.	.03	.03½	.03	.03½	.03	.03½
Sulfide, 500 lb bbls.....lb.	.12	.13	.12	.13	.12	.13½
Sulfocarbolate, 100 lb keg..lb.	.21	.22	.21	.22	.21	.24
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.02½	.03
Pure kegs.....lb.	.45	.50	.45	.50	.45	.50
Semi-refined kegs.....lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

Castor, No. 1, 400 lb bbls....lb.....	.09¾	.09¼	.10	.09½	.10¼
No. 3, 400 lb bbls.....lb.	.08¾	.09	.08½	.09½	.08¾	.10½
Blown, 400 lb bbls.....lb.	.11¼	.11¼	.11¼	.11¼	.11¾	.12½
China Wood, bbls spot NY...lb.	.06	.06½	.04⅞	.06½	.05½	.07¾
Tanks, spot NY.....lb.	.05⅜	.05½	.04½	.05½	.04½	.06⅞
Coast, tanks.....lb.	.05	.05½	.04⅜	.05½	.04¼	.06½
Coconut, edible, bbls NY....lb.....	.10¾	....	.10¾	.....	.10¾
Ceylon, 375 lb bbls NY....lb.	.04⅝	.04¼	.04	.04¼	.04	.04¾
8000 gal tanks NY.....lb.	.03¼	.03½	.03	.03¼	.02⅞	.03¼
Cochin, 375 lb bbls NY....lb.	.05¼	Nom.	.04½	.05¼	.04½	.06
TanksN Y.....lb.	.05	Nom.	.04	.05	.03½	.05
Manila, bbls NY.....lb.	.04¼	.04¾	.04	.04¾	.04	.05
Tanks NY.....lb.....	.03½	.03¼	.03½	.03¼	.04
Tanks, Pacific Coast....lb.	.03⅛	.03¼	.02⅝	.03¼	.02⅞	.03⅜
Cod, Newfoundland, 50 gal bbls .....gal.....	.23	.19	.23	.21	.30
Copra, bags, N. Y.....lb.....	.017	.016	.019	.0175	.0235
Corn, crude, bbls NY.....lb.	.06½	Nom.	.05¼	.06½	.04½	.09
Tanks, mills.....lb.....	.04½	.02⅞	.04¼	.02⅞	.04½
Refined, 375 lb bbls NY...lb.	.07½	Nom.	.06½	.07½	.05½	.07
Cottonseed, crude, mill.....lb.	.04	.04¼	.02⅝	.04¼	.02⅜	.04¼
Degras, American, 50 gal bbls NY.....lb.....	.03	.02½	.03	.02½	.04
English, brown, bbls NY...lb.	.03½	.03⅜	.02¼	.03⅜	.02⅞	.04
Greases, Brown.....lb.	.02	.02½	.02	.02½	.01⅜	.02⅜
Yellow.....lb.	.03½	.03⅜	.01⅞	.03⅜	.01⅜	.03
White, choice bbls NY.....lb.	.04½	.04⅜	.02½	.04⅜	.02	.04½
Herring, Coast, Tanks.....gal.	.18	Nom.	.11	.18	.....	.....
Lard Oil, edible, prime.....lb.....	.09	.08½	.09	.08½	.10
Extra, bbls.....lb.....	.08	.07⅝	.08	.05½	.07¾
Extra No. 1, bbls.....lb.....	.07¾	.06	.07¾	.05½	.07
Linseed, Raw, five bbl lots...lb.	.094	.095	.08	.095	.061	.078
Bbls c-l spot.....lb.	.086	.087	.072	.087	.053	.07
Tanks.....lb.	.08	.081	.066	.081	.047	.064
Menhaden Tanks, Baltimore.gal.....	.15	.09	.15	.09½	.20
Extra, bleached, bbls NY..gal.	.36	.37	.36	.37	.36	.40
Light, pressed, bbls NY....lb.....	.054	.039	.054	.....	.....
Yellow, bleached, bbls NY.gal.	.30	.30½	.30	.30½	.30	.37
Neatsfoot, CT, 20° bbls NY..lb.....	.15¾	.11¾	.15¾	.11½	.13½
Extra, bbls NY.....lb.....	.07	.06½	.07	.05½	.07
Pure, bbls NY.....lb.....	.13¼	.07¾	.13¼	.07¾	.09
Oleo, No. 1, bbls NY.....lb.....	.06¾	.05	.06¾	.05½	.07
No. 2, bbls NY.....lb.....	.06¼	.04¼	.06¼	.04¾	.06
No. 3, bbls NY.....lb.....	.06¼	....	.06¼	.....	.06¼
Olive, denatured, bbls NY...gal.....	.63	.47	.63	.51	.65
Edible, bbls NY.....gal.	1.30	1.50	1.30	1.50	1.25	2.00
Foots, bbls NY.....lb.	.05¼	.05¼	.04⅜	.05½	.04½	.05
Palm, Kernel Casks.....lb.	.04¾	Nom.	.04	.04¾	.035	.04⅜
Lagos, 1500 lb casks.....lb.	.03¼	Nom.	.02⅜	.03¼	.03	.05
Niger, Casks.....lb.	.03¾	.03¾	.024	.03¾	.03	.03½
Peanut, crude, bbls NY.....lb.	.07	Nom.	.03½	.07	.02⅜	.04½
Refined, bbls NY.....lb.	.08½	.11	.08½	.11	.08¼	.09
Perilla, bbls NY.....lb.	.07	.07½	.05	.07½	.03¾	.05¾
Tanks, Coast.....lb.	.06½	Nom.	.03¾	.06½	.03¾	.05
Poppyseed, bbls NY.....gal.....		1.70	1.60	1.70	1.60	1.75
Rapeseed, in bond, bbls NY.gal.	.40	.43	.33	.43	.....	.....
denatured, drms, NY.....gal.	.49	.50	.34	.50	.....	.....
Red, Distilled, bbls.....lb.....	.06⅝	.05⅞	.06⅝	.06½	.07
Tanks.....lb.....	.05¾	.05	.05¾	.05½	.06
Salmon, Coast, 8000 gal tks. gal.	.18	Nom.	.11	.18	.11	.19
Sardine, Pacific Coast tks...gal.	.20	Nom.	.09½	.20	.09½	.17½
Sesame, edible, yellow, dos...lb.	.09½	.10	.09½	.10	.08½	.09½
White, dos.....lb.	.10	.11	.10	.11	.10	.11
Sod, bbls NY.....gal.....		.40	....	.40	.....	.40
Soy Bean, crude.....						
Pacific Coast.....lb.....		Nom.	.032	.035	.02¾	.03½
Domestic tanks, f. o. b. mills, ...lb.....		.06	.027	.06	.03	.032
Crude, bbls NY.....lb.....		.066	.04	.066	.03⅜	.05
Refined, bbls NY.....lb.	.071	08	.04½	.08	.04½	.06
Sperm, 38° CT, bleached, bbls NY.....lb.....		.095	....	....	.....	.....
45° CT, bleached, bbls NY..lb.....		.088	....	....	.....	.....
Stearic Acid, double pressed dist bags.....lb.	.09	.09½	.07½	.09½	.07½	.09
Double pressed saponified bags .....lb.	.09	.09½	.08	.09½	.07	.08½
Triple, pressed dist bags..lb.	.11¾	.12¼	.10½	.12¼	.10½	.11
Stearine, Oleo, bbls.....lb.....		.05	.03½	.05	.03¾	.06
Tallow City, extra loose.....lb.....		.03¼	.02	.03¼	.02½	.03¾
Edible, tierces.....lb.....		.05¼	.03½	.05¼	.03½	.04¼
Tallow Oil, Bbls, c-1 NY...lb.	.05¾	.06	.05¼	.06	.05¼	.07½
Acidless, tanks NY.....lb.....		.06¾	.05	.06¾	.06	.09
Vegetable. Coast mats.....lb.	.04½	Nom.	.04½	Nom.	.06	Nom.
Turkey Red, single bbls.....lb.	.06¼	.07½	.06¼	.07½	.06¼	.09
Double, bbls.....lb.	.08	.09	.08	.09	.08	.11
Whale, bleached winter, bbls NY.....gal.....		.74	....	.74	.....	.74
Extra, bleached, bbls NY...lb.....		.06¼	....	....	.....	.....
Nat. winter, bbls NY.....lb.....		.06	....	....	.....	.....

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CHEMIST, 25 years of research and analytical experience as chemist and chief chemist in alloys, ores, fuels, paints and enamels. Box 310, CHEMICAL MARKETS.

CHEMIST, college graduate, married. Four years technical training including general analytical and research work in asphalt and asphalt products and one year in colloids and emulsifiers. Box 308, CHEMICAL MARKETS.

CHEMIST, many years of experience in the manufacture of lacquers, enamels, dyes and intermediates and pharmaceutical preparations. Eight years experience in the assaying of precicus metals. Development of rapid method of precipitating precious metals and other development work in this field. Box 311, CHEMICAL MARKETS.

CHEMIST, college graduate. Formulation of lacquers and color matching. Four years experience in sugar industry. General analytical work. Box 309, CHEMICAL MARKETS.

Your classified advertisement on this page brings results. If you are looking for a position or want help; have a business opportunity to advertise; wish to buy or sell used equipment or surplus stocks, —here is the place to tell about it.

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CHEMIST: Long experience intermediates, dyestuffs; Celanese colors (full line); metachrome colors (full line); dry colors; textile specialties (wetting out agents, stripping compounds); sodium bisulfite; synthetic tannins; highly practical; wants connection. Box 1018 CHEMICAL MARKETS.

Help Wanted

ASSISTANT SALES EXECUTIVE AND OFFICE MANAGER WANTED by old established company manufacturing non-staple chemical products having wide use in industry. Good opportunity for aggressive man with some years experience in chemical and related fields. Write Box No. 1019, CHEMICAL MARKETS stating experience, salary required and furnishing references.

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WATER WAX, high grade, bright-drying. Excellent durability, stability, and water-resistance. In bulk, reasonably priced. Box 1012, CHEMICAL MARKETS.

SUCCINIC ACID, best quality, for use with wine making: Japanese well known manufacturers want to export. Better opportunity for purchase because of Yen depreciation. Samples to be sent. Address: Soshichi Konishi & Co., 9, Honcho 2-chome, Nihonbashi, Tokio, Japan.

Business Opportunities

AGENCIES WANTED: Salesman 10 years' experience Industrial Chemicals and Raw Materials is open to represent out-of-town concern as local and export representative. Would also act as buying agent for manufacturing consumer. Can finance operating expense and furnish New York office facilities. Box 1016, CHEMICAL MARKETS.

MANUFACTURERS Agent or manufacturer with selling force wanted to produce several commodities in chemical and allied lines worked out by long-experienced research and development chemist. Very small initial outlay required to get under immediate production. Consumer acceptance already demonstrated. Box 1017, CHEMICAL MARKETS.

CAPABLE FINANCIAL ASSOCIATE desired for manufacture and sale of new lime paint keeping flies and insects out of stable and homes, non-injurious for men and animals. Box 1014, CHEMICAL MARKETS.

Index to Advertisers

Index to Advertisers

"We"—Editorially Speaking

"Business Betterment Begins"—so flashes the headlines, to which a particularly brutal heavy chemical sales manager adds—"Yes, we're not swapping dollars with our customers any longer: we're swapping customers with our competitors."

W. A. McDermid, who takes the issue of Government competition with private businesses very keenly, was born in Winnipeg, and became a student of commerce and administration at the University of Chicago. Twenty years of operating experience in advertising, sales and general management; consultant in management, with special reference to sales and merchandising for the past six years, have bestowed upon him an unusually canny observation of what this competition means to the business public. In 1917 he organized the New Jersey Division, Protective League, and directed its affairs until 1919; has been a director of the American Fair Trade League Advisory Committee and Association of National Advertisers (also Pres.); member Executive Committee, American Society of Sales Executives; charter member, New York Sales Managers Club (also Pres. and Vice-Pres.). Clubs: Advertising, Sphinx, and Union League (N. Y.).

The development of the steam springs of Tuscany is of unusual interest, and in a paper read before the Royal Society of Arts, the Hon. Senatore Prince Ginori Conti traced the history and growth of the borax works at Larderello from the time that boric acid was discovered in one of the pools in 1777 until the present.

A lot of us of the old Yankee stock who normally haven't much left of the New England tradition except a hearty appetite for the mid-day meal are a bit shocked to learn Uncle Sam doesn't mean what he says on his gold bills, his treasury certificates, and his bonds. It's the only decent argument we know for debt cancellation.

The President of the varied Hooker Electrochemical interests, whose address before the M. C. A. appears in this issue, was one of the organizers of that Association. He is a member of the A. C. S., Century, University, and Chemists' Clubs (N. Y.), and it may not be generally known, but some time back he was enamored of political aspirations which faded into the background with other and bigger interests, although he is still often fondly dubbed as the "Reformed Politician of Chemical Industry."

Charles Belknap, whose office was pictured in our roto some months ago, has a love of the sea as was evidenced by those of us who studied the photograph carefully. In 1919 he resigned his Commission as Commander U. S. N. and became associated with The Russell Company, later connecting with Anderson Chemical Company which concern was absorbed by the Merrimac interests and over which Mr. Belknap now wields a President's hand.

One trouble with a college professor as a labor adviser is that his practical experience has been confined to discharging in his wife's name a maid-of-all-work. And the analogy might be very considerably extended in other directions throughout the world of affairs.

From test tube to autoclave in chemical operation has been the wide experience of George C. McCarten, chemical engineer, his experience being gleaned from connections with General Chemical, Sherwin-Williams, New Jersey Zinc, and Charles Pfizer, in all instances being connected with development departments.

"Charter" has been granted as a trademark in England for "chemicals used in philosophical research"—a line we presume will include Job's tears, spirits of hartshorn, and philosopher's stones.

Hurter's capital description of the Scholler Process for obtaining ethyl alcohol from wood which appeared in our May number called forth an interesting debate the other day among chemical engineers who wondered why Germany was spending so much money and effort in a process that has such very obvious economic objections. The concluding guess was that somebody had a good process for sale.

That we are thoroughly read by the chemical consuming industries we are well aware, but were we surprised when the Aldridge Clothing Co., of Hopewell, Va., asked us for the name of the manufacturer of the celanese suits shown in the May rotogravure section! We chuckle when we think that we have become style dictators for chemical executives, engineers and chemists at America's greatest air nitrogen plant. Muscle Shoals, Merseburg Billingham papers please copy.

Charles F. Abbott, whose thoughts on profits are published in this number, was director of publicity for the National Aniline before he resigned several years ago to assume executive charge of one of the large steel trade associations. He is famous as a dynamic public speaker; the propounder of original ideas; the personal friend of more big executives in American industry than any other man in the country; and one of the public spirited citizens of Montclair, N. J. He has kept his contracts with the chemical field, and his always stimulating talks are always worth reading.

JULY, 1933

What with the Economic Conference in London, the Labor Conference in Geneva, the Golf Conference at Westchester Hills, the chemical news of the month ought to be good reading even in hot weather, and we promise that neither mosquitoes nor humidity will be able to divert your attention once you begin on any of the following articles scheduled for our July issue.

"Seasonal Variation"— is a statistical term that means a great deal more in considering chemical operations than you would suspect and if you don't try working out the formula on your own production program and sales schedule you are less curious about better business than we give you credit for being.

"Economy in the Small Plant"—some practical suggestions that help solve the problem of all problems.

"Lead Salts"—of all the metal derivatives none go more widely into chemical fields than the salts of lead which are carefully analyzed statistically for price and production trends.